



Introduction to Cloud Computing and AWS

- Provides on-demand delivery of compute power, database storage, applications, and other IT resources via the Internet.
- Access as many resources as you need - almost instantly.
- Only pay for what you use: pay-as-you-go pricing.
- Simple way to access servers, storage, databases and a broad set of application services over the Internet.
- Amazon Web Services (AWS) is a cloud services platform that owns and maintains the network-connected hardware, while you provision and use what you need via a web application.



AWS Services & Terms

- **EC2:** Amazon Elastic Compute Cloud (EC2) provides resizable compute capacity in the cloud, includes server configuration and hosting.
 - **Service to provide a virtual machine**
- **Instance:** Virtual computing environments on EC2.
 - **a.k.a. virtual machine**
- **EBS:** Elastic Block Storage is block storage service that is used with EC2 instances.
- **S3:** Amazon Simple Storage Service (S3) can be used to store and retrieve any amount of data.
- **AMI:** Amazon Machine Image is a special feature that is used to create a virtual machine within the Amazon Elastic Compute Cloud ("EC2") used to deploy applications.
 - **a.k.a. pre-built virtual environment**
- Many, many more services and terms: <https://docs.aws.amazon.com/index.html>



Using AWS EC2

1) **Launch Instance**

2) **Manage Instance**

3) **Access Instance**

4) **Do Science!**



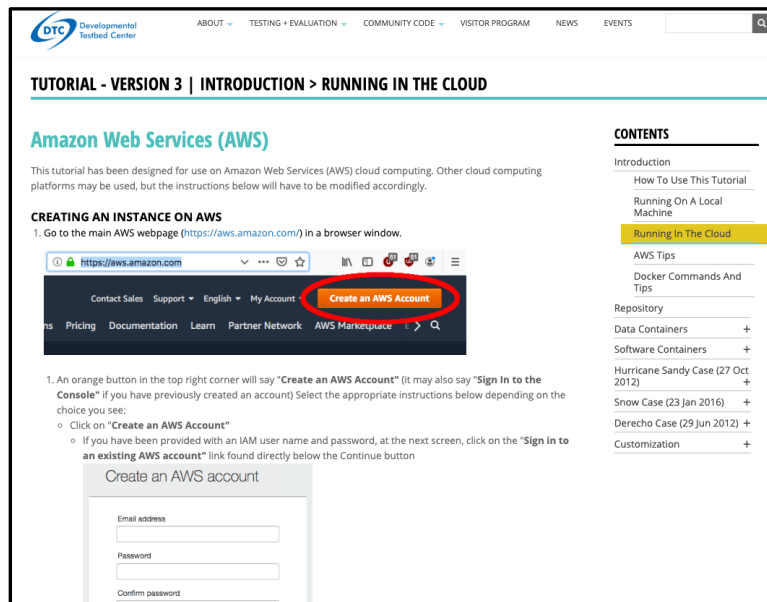
- **Via AWS Console (web interface)**
- **Via AWS Command Line Interface (AWS CLI)**

Using AWS EC2

- 1) Launch Instance
- 2) Manage Instance
- 3) Access Instance
- 4) Do Science!



- **Already done for this tutorial.**
- **But, will give brief overview using the AWS console (web interface).**

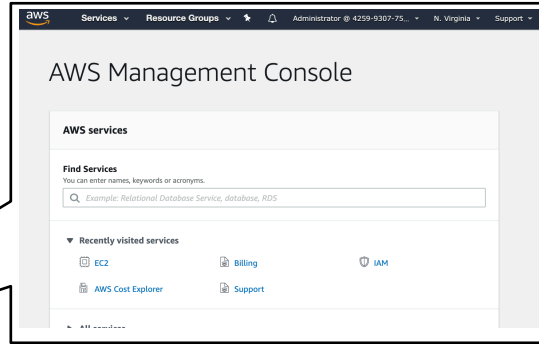


Procedures also available under the Introduction section of the Online Tutorial: “Running In The Cloud”

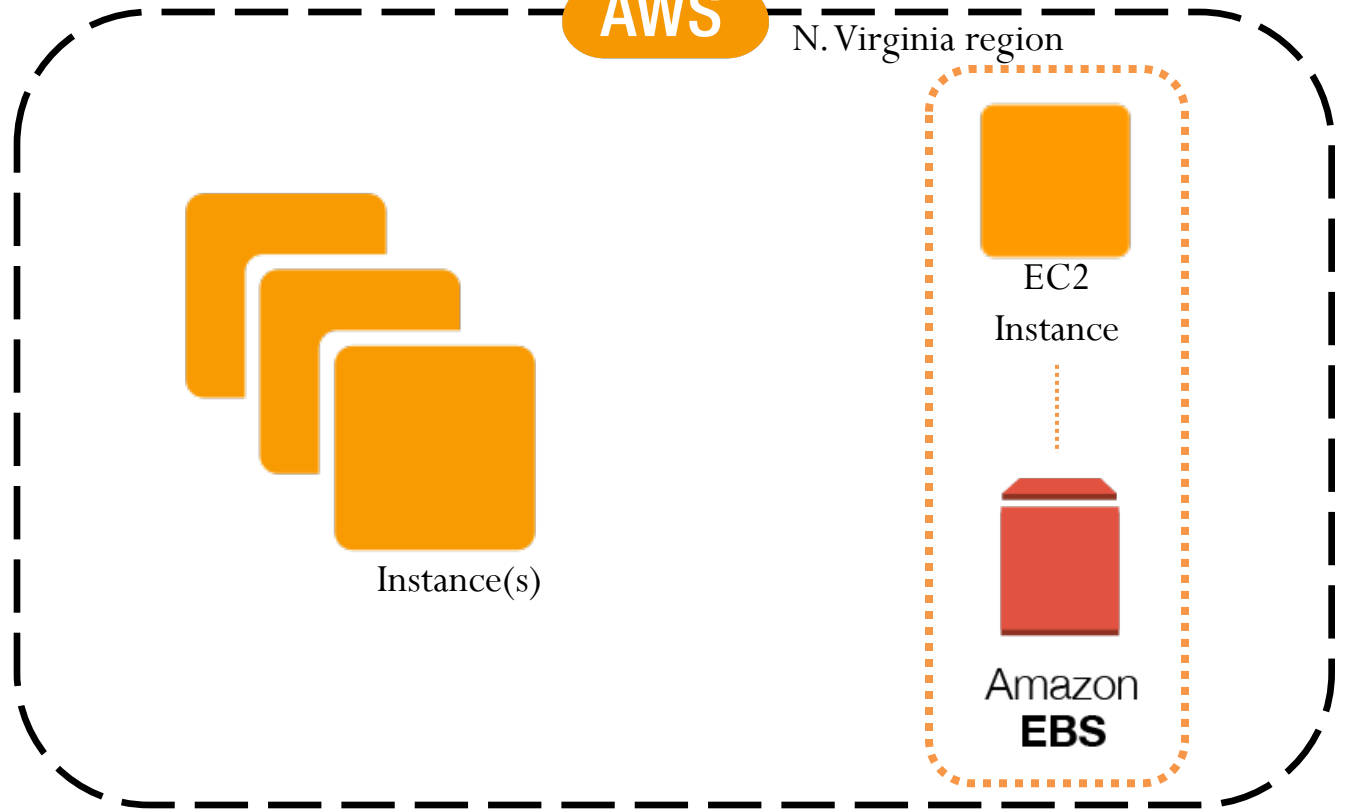
Set up & Launch your instance using AWS console



You!



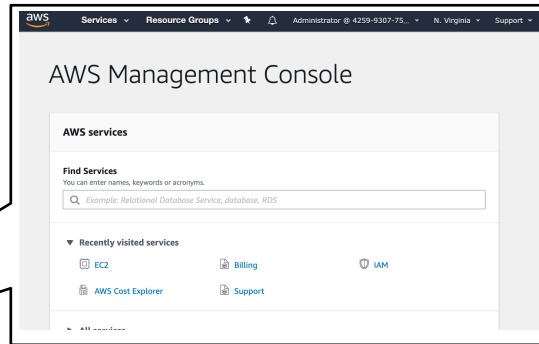
N. Virginia region



Set up & Launch your instance using AWS console



You!



N. Virginia region

AMI: container-dtc-nwp-AWS_SC

- git
- wgrib2
- 60GB Amazon EBS
- Image Magick
- GCC
- docker
- NWP container repository
- AWS Linux 2



AMI



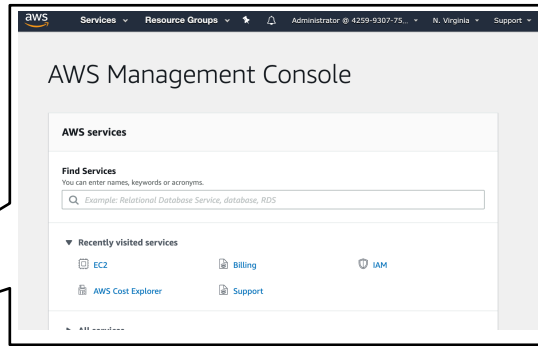
EC2 Instance

Amazon EBS

Set up & Launch your instance using AWS console



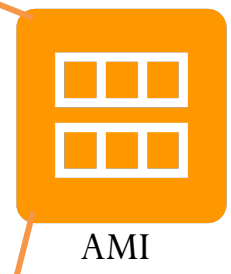
You!



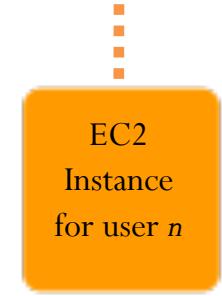
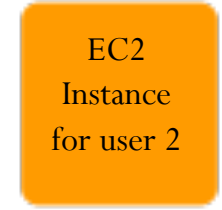
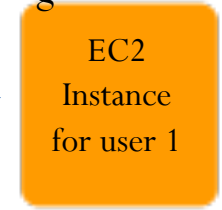
N. Virginia region

AMI: container-dtc-nwp-AWS_SC

- git
- wgrib2
- 60GB Amazon EBS
- Image Magick
- GCC
- docker
- NWP container repository
- AWS Linux 2

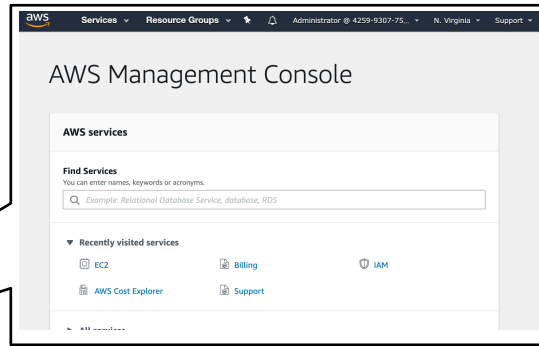


AMI

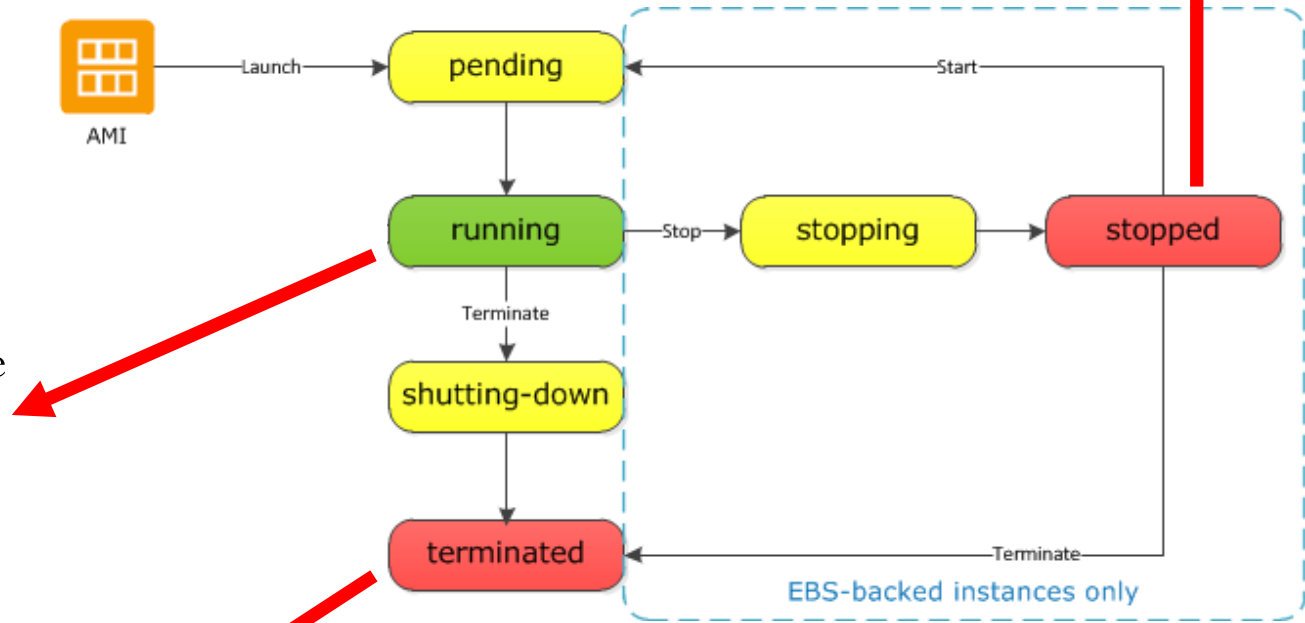


Manage your Instance via AWS Console

You!



Instance Life Cycle



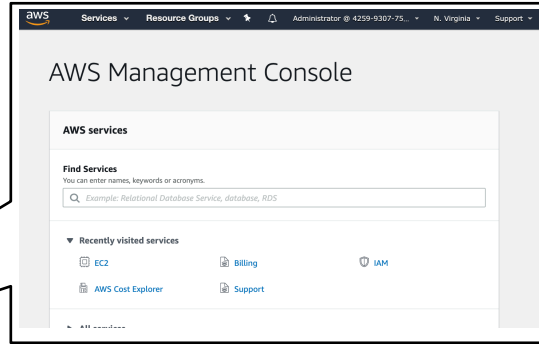
Stopped: The instance is shut down and cannot be used. But can be restarted at any time. No charges for EC2 Instance.

Running: Instance is running and accessible. Account charged.

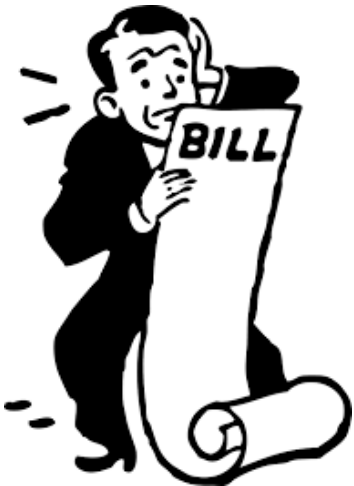
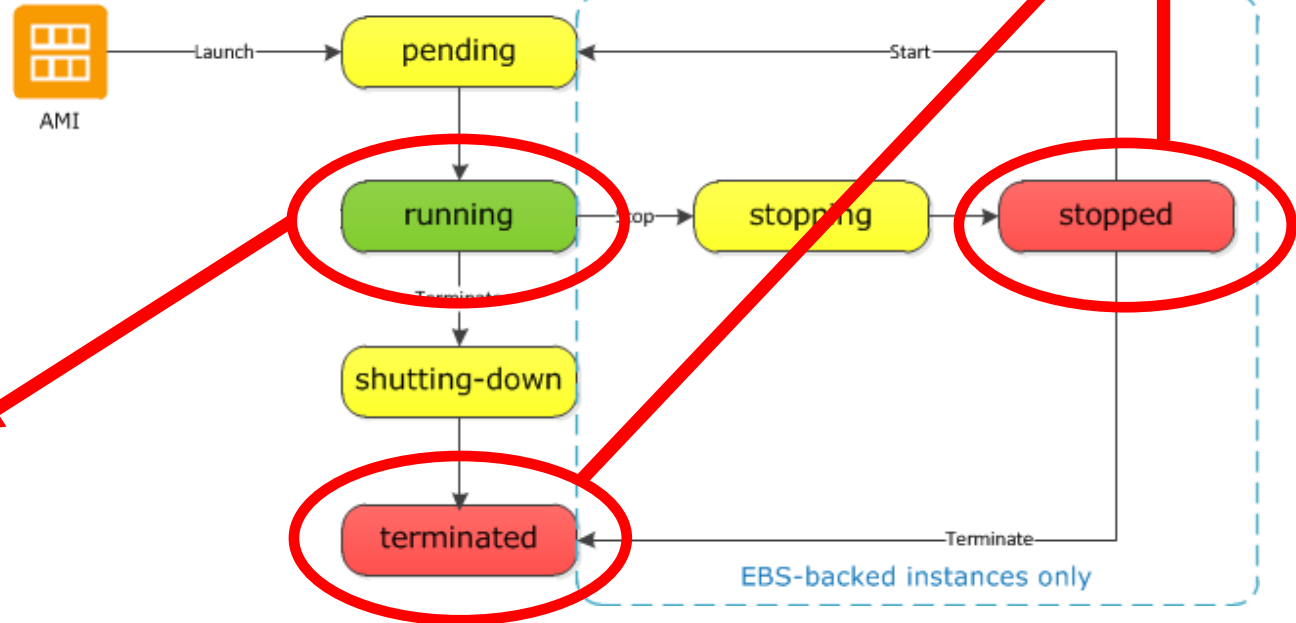
Terminated: Instance has been permanently deleted and cannot be restarted. All data gone. No charges.

Manage your Instance via AWS Console

You!



Instance Life Cycle

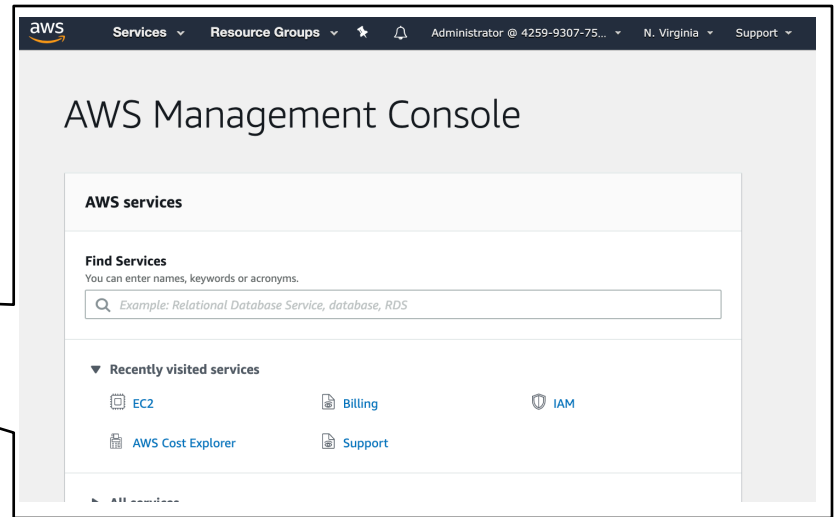


Always Stop Your Instance!!



AWS Console Tour

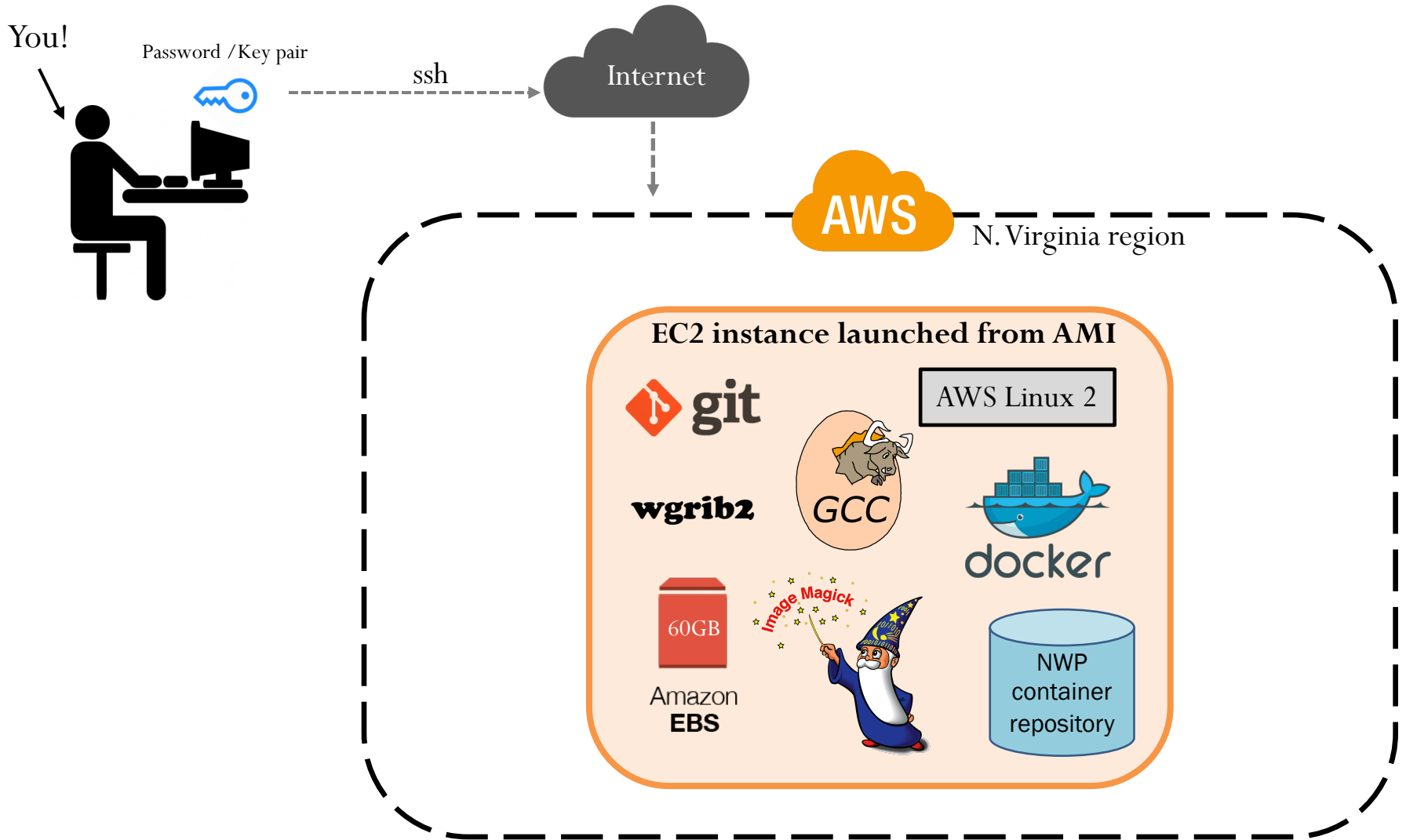
You!



Let's take a look....

<https://aws.amazon.com/>

Access & Do Science with your Instance via ssh



Login to your EC2 Instance

- Open a Terminal Window
- Navigate to a working directory
- Use the login credentials provided
 - All participants use username: “ec2-user”
 - Each participant has a **unique IP** address and **password**

Mac Users:

```
>> ssh -Y ec2-user@yourIPaddress
[enter password]
```

Other Users:

```
>> ssh -X ec2-user@yourIPaddress
[enter password]
```

You!



```
[falkor.local:/Users/fossell/AWS>
[falkor.local:/Users/fossell/AWS>ssh -Y ec2-user@3.93.181.64
ec2-user@3.93.181.64's password:
Warning: No xauth data; using fake authentication data for X11 forwarding.
Last login: Sun Jan  5 04:32:17 2020 from 75-163-180-95.clsp.qwest.net

  _|  ( _|_ )
  _|  ( _|_ /   Amazon Linux 2 AMI
  _|\_|_|_|_|

https://aws.amazon.com/amazon-linux-2/
[[ec2-user@ip-172-31-30-2 ~]$
```

- Logged into EC2 Instance
- Bash Shell