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.

Source: Adapted from AWS
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](https://docs.aws.amazon.com/index.html)

Source: Adapted from AWS
Using AWS EC2

1) Launch Instance
   - Via AWS Console (web interface)

2) Manage Instance
   - Via AWS Command Line Interface (AWS CLI)

3) Access Instance

4) Do Science!
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

Source: Adapted from AWS
Set up & Launch your instance using AWS console

You!

AMI: container-dtc-nwp-AWS_SC

AWS Linux 2

wgrib2

GCC

docker

Image Magick

Amazon EBS

60GB

NWP container repository

Source: Adapted from AWS
Set up & Launch your instance using AWS console

You!

Source: Adapted from AWS
Manage your Instance via AWS Console

You!

**Instance Life Cycle**

**Running:** Instance is running and accessible. Account charged.

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

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

Source: Adapted from AWS
Manage your Instance via AWS Console

Always Stop Your Instance!!

Source: Adapted from AWS
AWS Console Tour

Let’s take a look….

https://aws.amazon.com/
Access & Do Science
with your Instance via ssh

You!

Password /Key pair

ssh

Internet

AWS
N. Virginia region

EC2 instance launched from AMI

git

wgrrib2

GCC

docker

AWS Linux 2

60GB

Amazon EBS

Image Magick

NWP container repository

Source: Adapted from AWS
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!

You have logged into your EC2 instance with the following details:

Amazon Linux 2 AMI

You are in the Bash Shell

You have access to the following:
- Logged into EC2 Instance
- Bash Shell