

[AWS Machine Learning Blog](#)

Get Started with Deep Learning Using the AWS Deep Learning AMI

by Cynthia Peranandam | on 13 SEP 2017 | in [Artificial Intelligence](#), [AWS Deep Learning AMIs](#) | [Permalink](#) | [Comments](#) |

[Share](#)

Whether you're new to deep learning or want to build advanced deep learning projects in the cloud, it's easy to get started by using AWS.

[Amazon SageMaker](#), our fully-managed machine learning platform, makes it easy to quickly and easily build, train, and deploy machine learning models at any scale. The [AWS Deep Learning AMIs](#) (Amazon Machine Images) let you build custom environments and workflows. Both Amazon SageMaker and the AMIs come pre-installed with popular open-source deep learning frameworks including TensorFlow, Apache MXNet, PyTorch, and Chainer, all optimized for high performance on AWS. In this blog post, we'll focus on the AMIs. For information about getting started with Amazon SageMaker, see this [blog post](#).

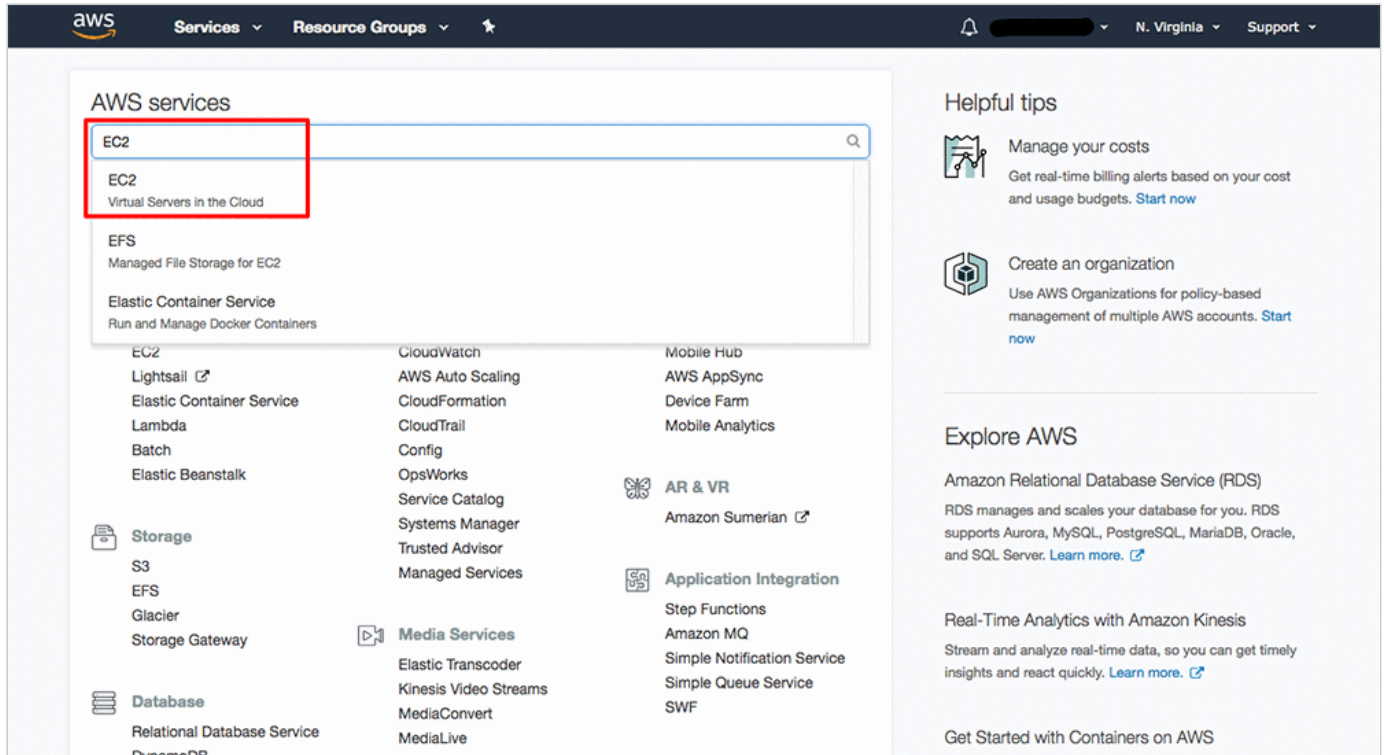
You can train custom models, experiment with new algorithms, and learn new deep learning skills and techniques. There is no additional charge to use the AMIs—you pay only for the AWS resources needed to store and run your applications.

The AMIs offer GPU acceleration through pre-configured CUDA and cuDNN drivers, as well as CPU acceleration through Intel MKL-DNN drivers. Available for both Ubuntu and Amazon Linux, the AMIs also come bundled with popular data science and Python packages. In addition, you can choose either Conda AMIs with pre-installed frameworks and drivers in separate virtual environments, or base AMIs that allow end-to-end customization.

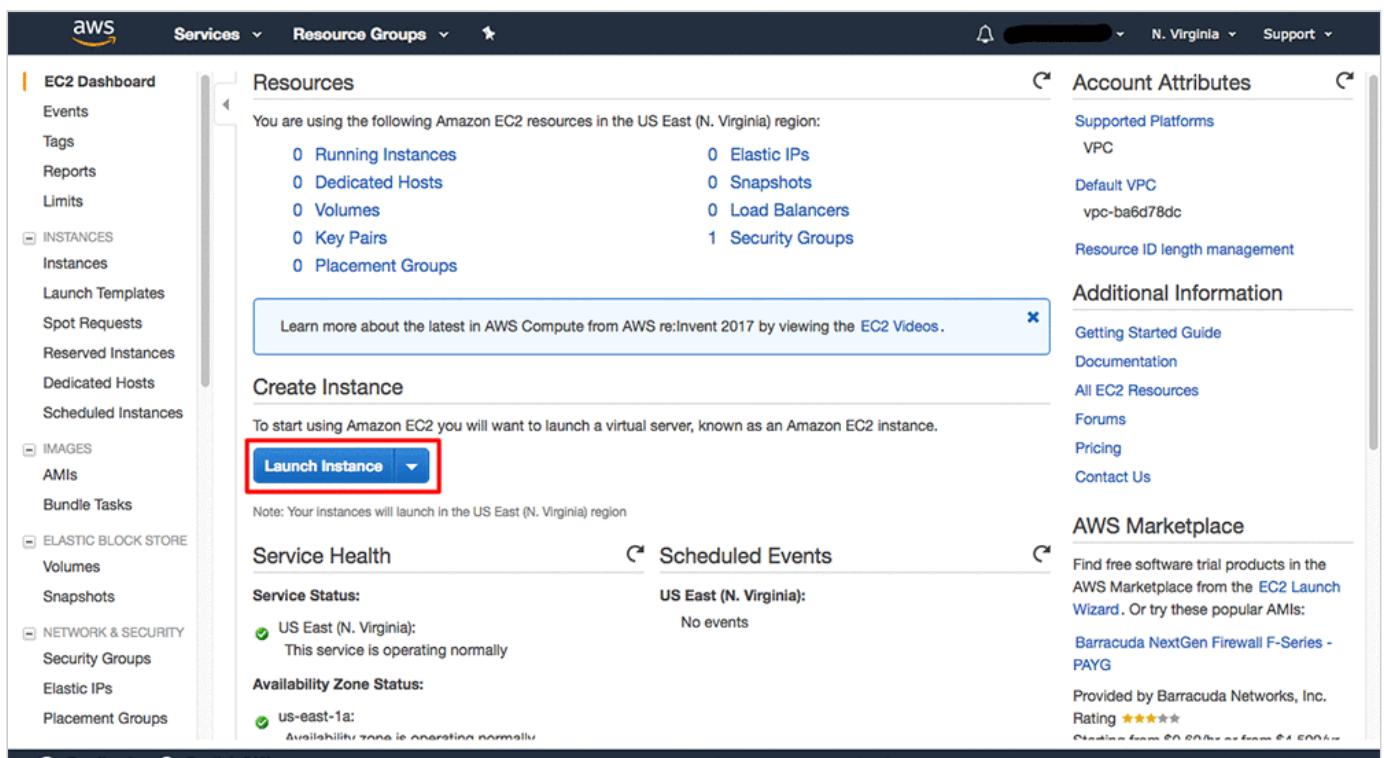
In this step-by-step tutorial, we'll show you how to set up the AWS Deep Learning AMIs.

Step 1: Open the EC2 Console

Sign into the [AWS Management Console](#) with your user name and password to get started. Then type **EC2** in the search bar and open the EC2 service console.

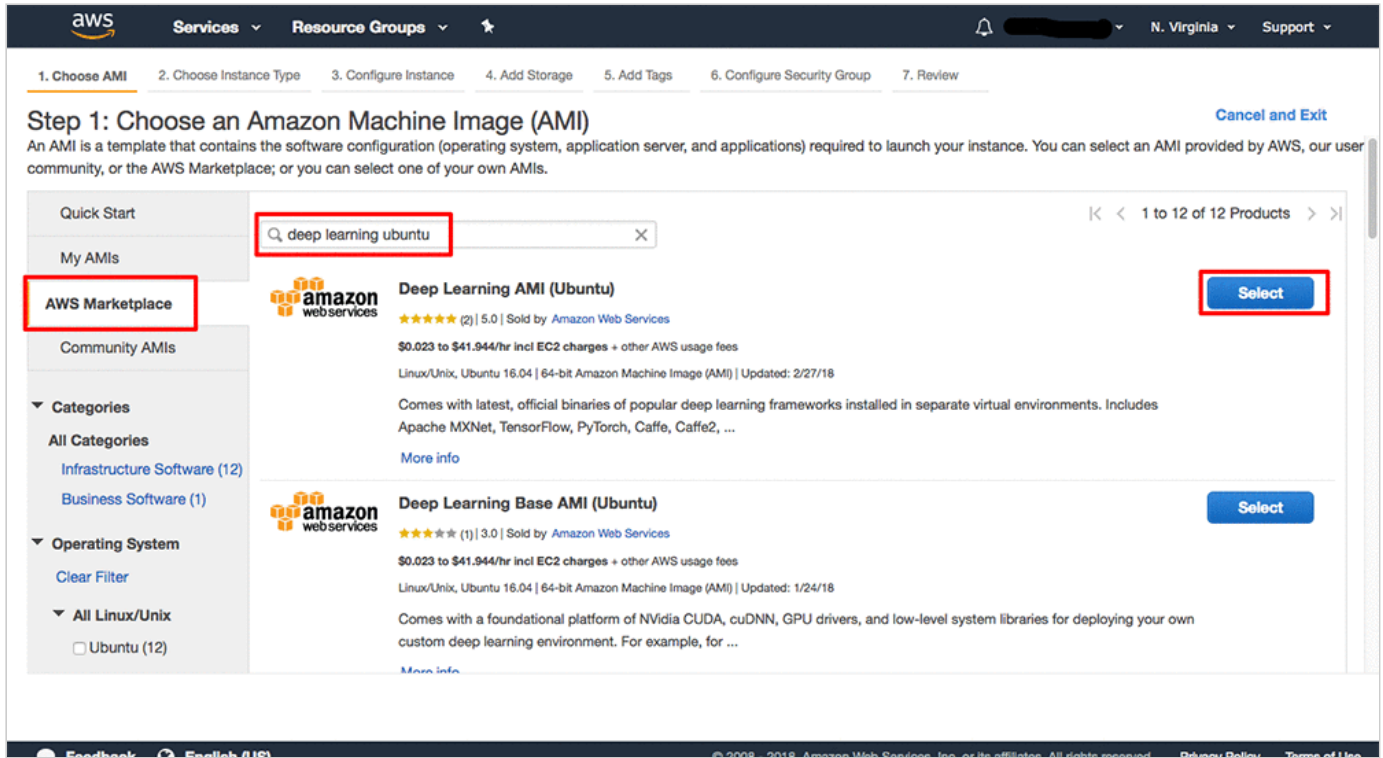


Step 1b: Choose the Launch Instance button

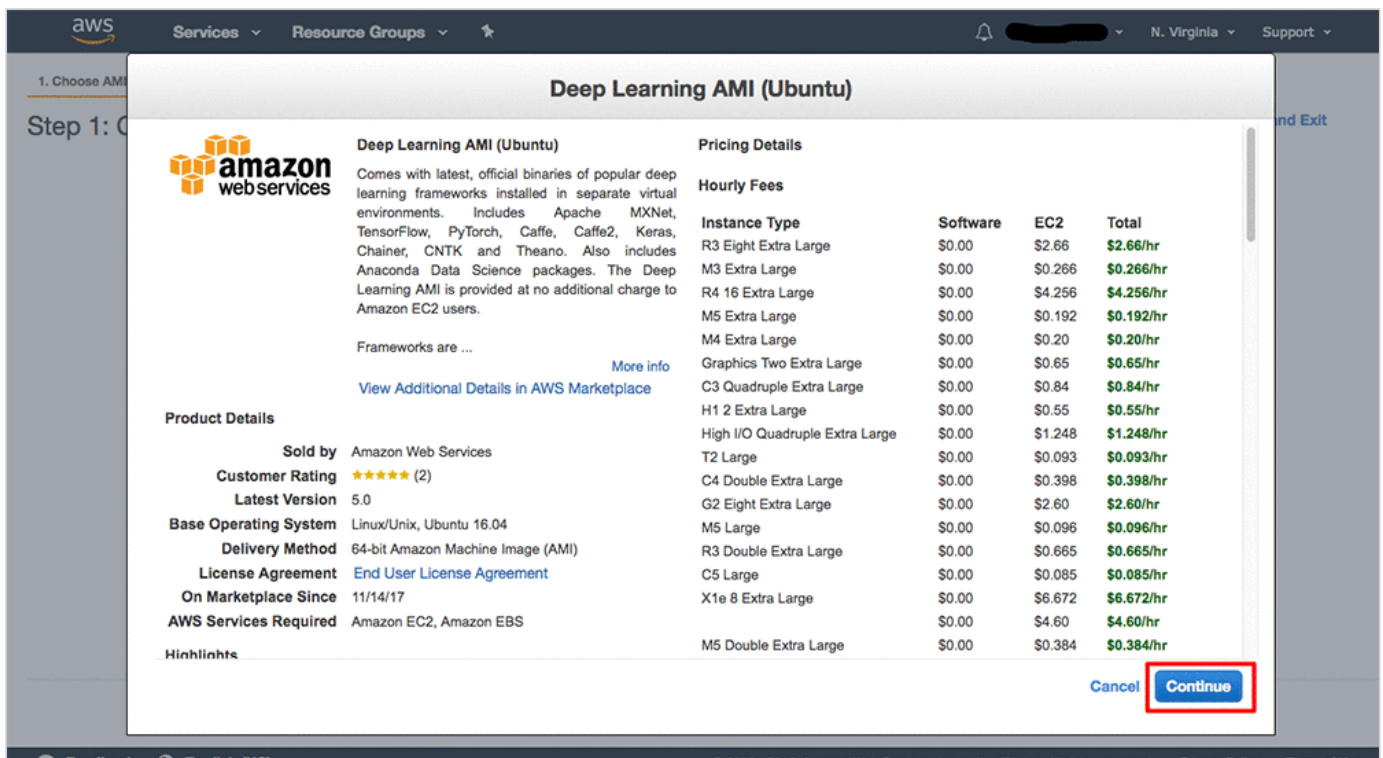


Step 2a: Select the AWS Deep Learning AMI

Choose the AWS Marketplace tab on the left, and then search for "deep learning ubuntu." Select the **Deep Learning AMI (Ubuntu)**. You can also select the Base AMI to set up custom builds of deep learning frameworks. Both AMIs are also available for Ubuntu and Amazon Linux.



Step 2b: On the details page, choose Continue



Step 3a: Select an instance type

Choose an instance type for your deep learning training and deployment needs, and then click **Review and Launch**. Here we have picked a **P3** instance.

Step 2: Choose an Instance Type

| Instance Type | GPU Instances | Instance Type | VCPU | Memory (GiB) | Storage | EBS-Optimized | Network Performance | Eligible for Free Usage Tier |
|-------------------------------------|------------------|---------------|------|--------------|---------------|---------------|---------------------|------------------------------|
| <input type="checkbox"/> | GPU instances | g2.2xlarge | 8 | 15 | 1 x 60 (SSD) | Yes | High | - |
| <input type="checkbox"/> | GPU instances | g2.8xlarge | 32 | 60 | 2 x 120 (SSD) | - | 10 Gigabit | - |
| <input type="checkbox"/> | GPU compute | p2.xlarge | 4 | 61 | EBS only | Yes | High | Yes |
| <input type="checkbox"/> | GPU compute | p2.8xlarge | 32 | 488 | EBS only | Yes | 10 Gigabit | Yes |
| <input type="checkbox"/> | GPU compute | p2.16xlarge | 64 | 732 | EBS only | Yes | 25 Gigabit | Yes |
| <input checked="" type="checkbox"/> | GPU compute | p3.2xlarge | 8 | 61 | EBS only | Yes | Up to 10 Gigabit | Yes |
| <input type="checkbox"/> | GPU compute | p3.8xlarge | 32 | 244 | EBS only | Yes | 10 Gigabit | Yes |
| <input type="checkbox"/> | GPU compute | p3.16xlarge | 64 | 488 | EBS only | Yes | 25 Gigabit | Yes |
| <input type="checkbox"/> | Memory optimized | r4.large | 2 | 15.25 | EBS only | Yes | Up to 10 Gigabit | Yes |
| <input type="checkbox"/> | Memory optimized | r4.xlarge | 4 | 30.5 | EBS only | Yes | Up to 10 Gigabit | Yes |
| <input type="checkbox"/> | Memory optimized | r4.2xlarge | 8 | 61 | EBS only | Yes | Up to 10 Gigabit | Yes |
| <input type="checkbox"/> | Memory optimized | r4.16xlarge | 16 | 122 | EBS only | Yes | Up to 10 Gigabit | Yes |

Buttons: Cancel, Previous, **Review and Launch**, Next: Configure Instance Details

Step 3b: Launch your instance

Choose **Launch** on the Review page.

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

⚠ Your instance configuration is not eligible for the free usage tier

To launch an instance that's eligible for the free usage tier, check your AMI selection, instance type, configuration options, or storage devices. Learn more about [free usage tier](#) eligibility and usage restrictions.

[Don't show me this again](#)

AMI Details [Edit AMI](#)

Deep Learning AMI (Ubuntu)

Latest versions of deep learning frameworks pre-installed in separate virtual environments: MXNet, TensorFlow, Caffe, Caffe2, PyTorch, Theano, CNTK, Keras

Root Device Type: ebs Virtualization type: hvm

Hourly Software Fees: \$0.00 per hour on p3.2xlarge instance (Additional taxes may apply.)

Software charges will begin once you launch this AMI and continue until you terminate the instance.

By launching this product, you will be subscribed to this software and agree that your use of this software is subject to the pricing terms and the seller's [End User License Agreement](#)

Instance Type [Edit instance type](#)

| Instance Type | ECUs | vCPUs | Memory (GiB) | Instance Storage (GB) | EBS-Optimized Available | Network Performance |
|---------------|------|-------|--------------|-----------------------|-------------------------|---------------------|
| p3.2xlarge | 23.5 | 8 | 61 | EBS only | Yes | Up to 10 Gigabit |

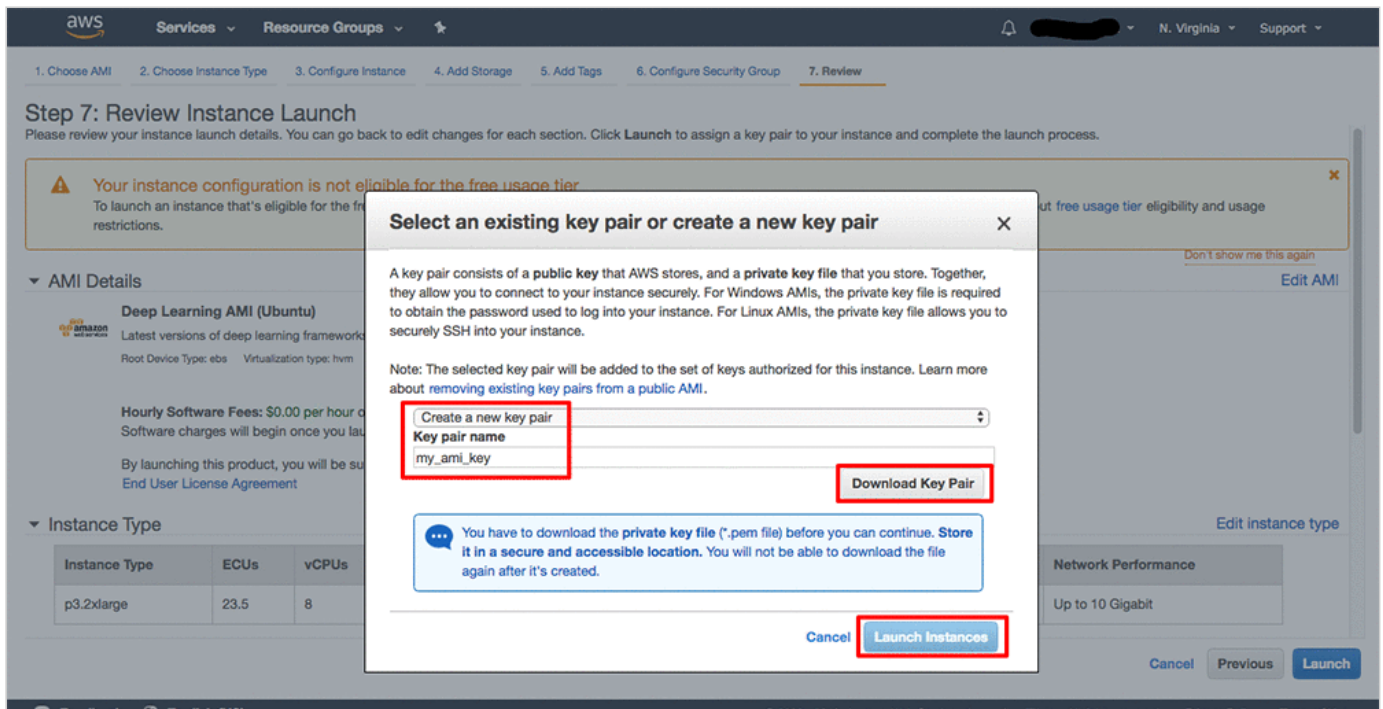
Security Groups [Edit security groups](#)

Buttons: Cancel, Previous, **Launch**

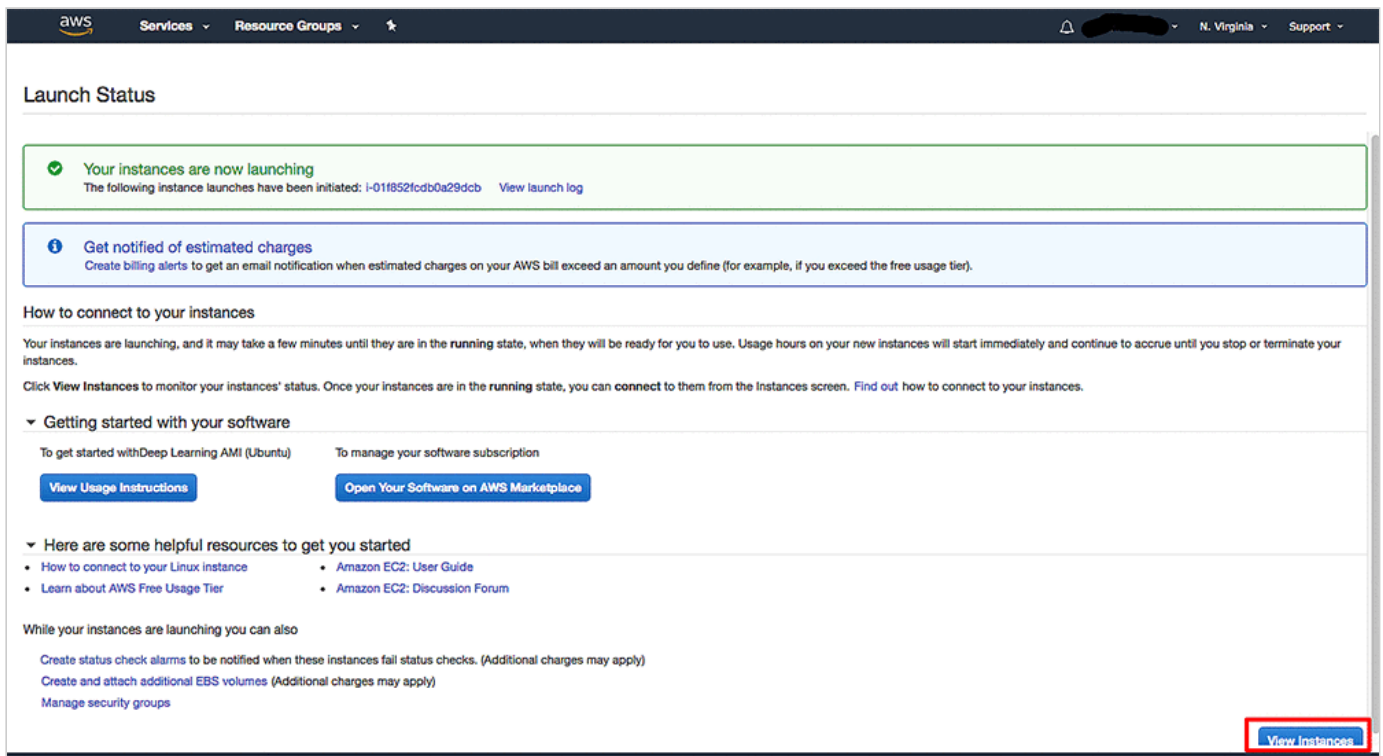
Step 4: Create a new private key file

If you don't already have a private key pair, create one by selecting **Create a new key pair**, and download it to a safe location. Then launch your instance. If your instance fails to launch because of an instance limit,

you need to request an increase through the AWS Support Center.



Step 5: Click View Instance to see your instance status



Step 6: Find your instance's public DNS and copy it

The screenshot shows the AWS Management Console interface. On the left, there is a navigation menu with categories like INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The main area displays a list of EC2 instances. One instance is selected, and its details are shown in a tabbed view. The 'Description' tab is active, showing various attributes of the instance. The public DNS is highlighted with a red box.

| Name | Instance ID | Instance Type | Availability Zone | Instance State | Status Checks | Alarm Status | Public DNS (IPv4) | IPv4 Public IP |
|------|--------------------|---------------|-------------------|----------------|----------------|--------------|--|----------------|
| | i-01f852fcd0a29dcb | p3.2xlarge | us-east-1f | running | 2/2 checks ... | None | ec2-18-232-55-12.compute-1.amazonaws.com | 18.232.55.12 |

Instance: i-01f852fcd0a29dcb Public DNS: ec2-18-232-55-12.compute-1.amazonaws.com

| Description | | Status Checks | Monitoring | Tags |
|-------------------|---|----------------|-------------------------------|-----------------------|
| Instance ID | i-01f852fcd0a29dcb | Instance state | running | Public DNS (IPv4) |
| Instance type | p3.2xlarge | Instance type | p3.2xlarge | IPv4 Public IP |
| Elastic IPs | | Elastic IPs | | IPv6 IPs |
| Availability zone | us-east-1f | Private DNS | ip-172-31-92-101.ec2.internal | Private IPs |
| Security groups | Deep Learning AMI -Ubuntu--5-0- AutogenByAWSMP- view inbound rules | Private IPs | 172.31.92.101 | Secondary private IPs |

Step 7: Open your command line terminal

In the terminal, use the following commands to change to the directory where your security key is located, then connect to your instance using SSH. (NOTE: Replace text below in red.)

```
cd /Users/your_username/Downloads/
chmod 0400 <your .pem file name>
ssh -L localhost:8888:localhost:8888 -i <your .pem file name> ubuntu@<Your instance public DNS>
```

Step 8: Open Jupyter

Then copy the URL indicated.

Step 9: Start a new notebook

Open a browser window and navigate to the URL indicated in the last step. Choose **New** and start a new notebook using any popular deep learning framework including TensorFlow, Apache MXNet and Gluon, Torch, PyTorch, Caffe, Caffe2, Keras, Theano, Microsoft Cognitive Toolkit, and Chainer.



Now that you've launched the AWS Deep Learning AMI, you can easily run tutorials for computer vision, natural language processing, recommendation systems, and more using the deep learning framework of your choice. Happy modeling!

Learn more:

- Find out more about using various deep learning frameworks including TensorFlow, Apache MXNet, PyTorch, and more in our [Getting Started](#)
- Use this [step-by-step tutorial](#) to activate the TensorFlow framework on the AMIs.
- Use this [step-by-step tutorial](#) to activate the Apache MXNet framework on the AMIs.

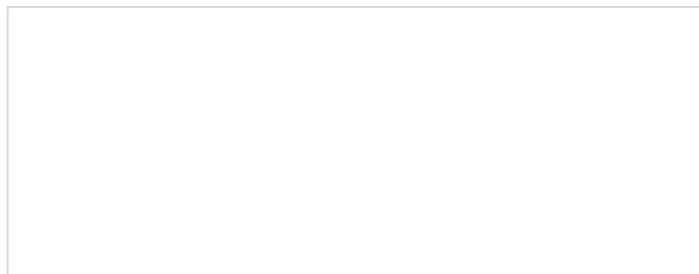
Updated March 26, 2018

About the author



Cynthia Peranandam is a Principal Marketing Manager for AWS artificial intelligence solutions, helping customers use deep learning to provide business value. In her spare time she likes to run and listen to music.

TAGS: [AWS Deep Learning](#), [Deep Learning AMI](#)



**AWS Training & Certifications**

Free digital courses to help you develop your skills

[Learn more »](#)

**AWS Podcast**

Subscribe for weekly AWS news and interviews

[Learn more »](#)

**AWS Partner Network**

Find an APN member to support your cloud business needs

[Learn more »](#)

Resources

[Getting Started](#)







[What's New](#)

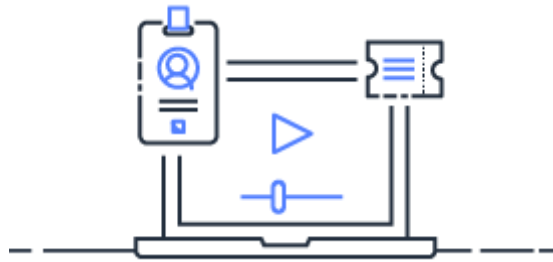
[Top Posts](#)

[Official AWS Podcast](#)

[AWS Case Studies](#)

Follow

-  [Twitter](#)
-  [Facebook](#)
-  [LinkedIn](#)
-  [Twitch](#)
-  [RSS Feed](#)
-  [Email Updates](#)



AWS Events

Discover the latest AWS events in your region

[Learn more »](#)

Related Posts

[Build machine learning-powered business intelligence analyses using Amazon QuickSight](#)

[In the News: AWS Powers Real-time Statistics for Guinness Six Nations](#)

[7 defunct restaurant brands we can learn from](#)

[Amazon Comprehend now supports multi-label custom classification](#)

[Unlocking the Value of Your Contact Center Data with TrueVoice Speech Analytics from Deloitte](#)

[Building a business intelligence dashboard for your Amazon Lex bots](#)

[Convenient Conversations: How conversational AI elevates the traveler experience](#)

[How to Translate Large Text Documents with Amazon Translate](#)

