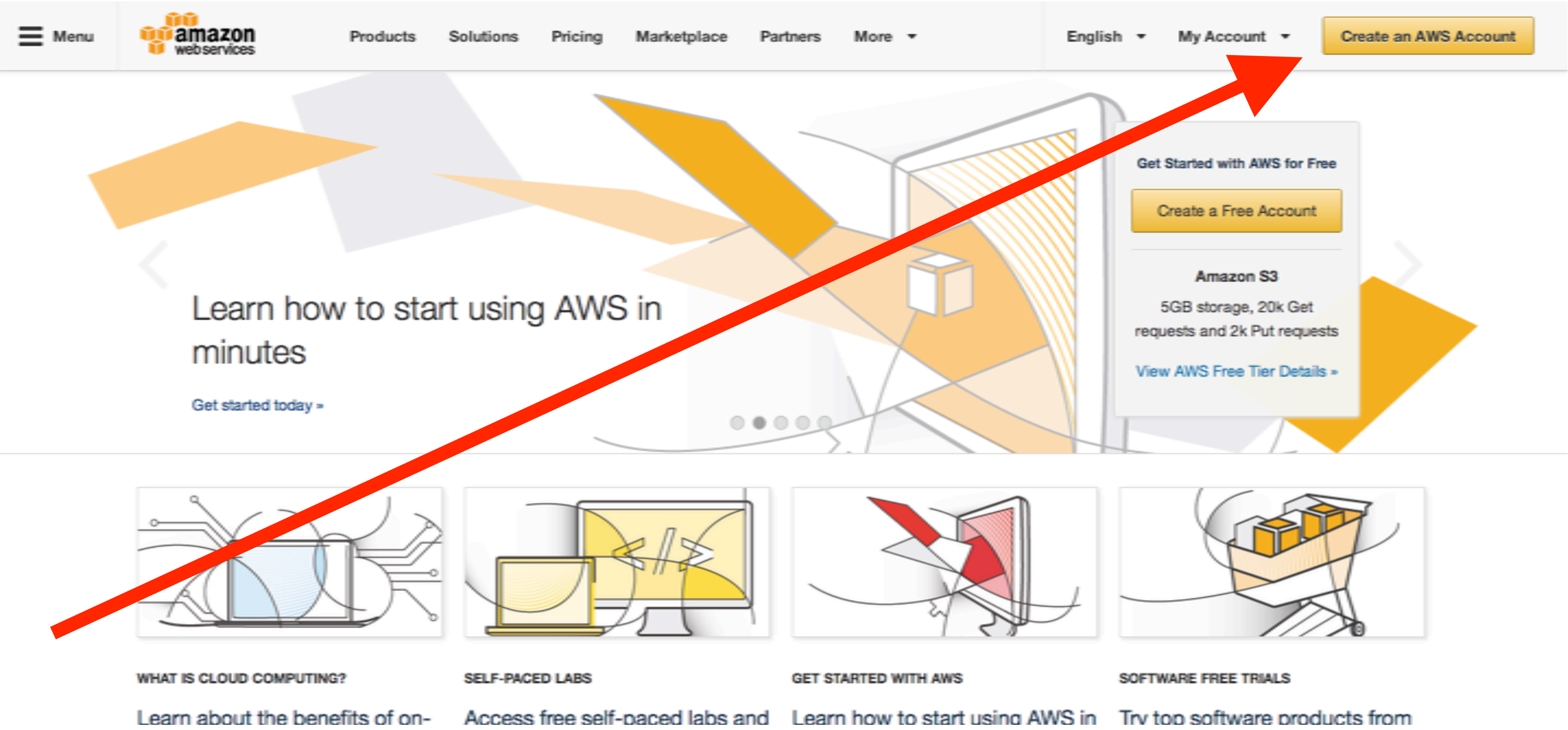
AWS Deployment

Insight Data Science



Get Started with AWS for Free

Amazon S3

5GB storage, 20k Get requests and 2k Put requests

Learn how to start using AWS in minutes

WHAT IS CLOUD COMPUTING?

Learn about the benefits of on-

SELF-PACED LABS

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GET STARTED WITH AWS

Learn how to start using AWS in

SOFTWARE FREE TRIALS

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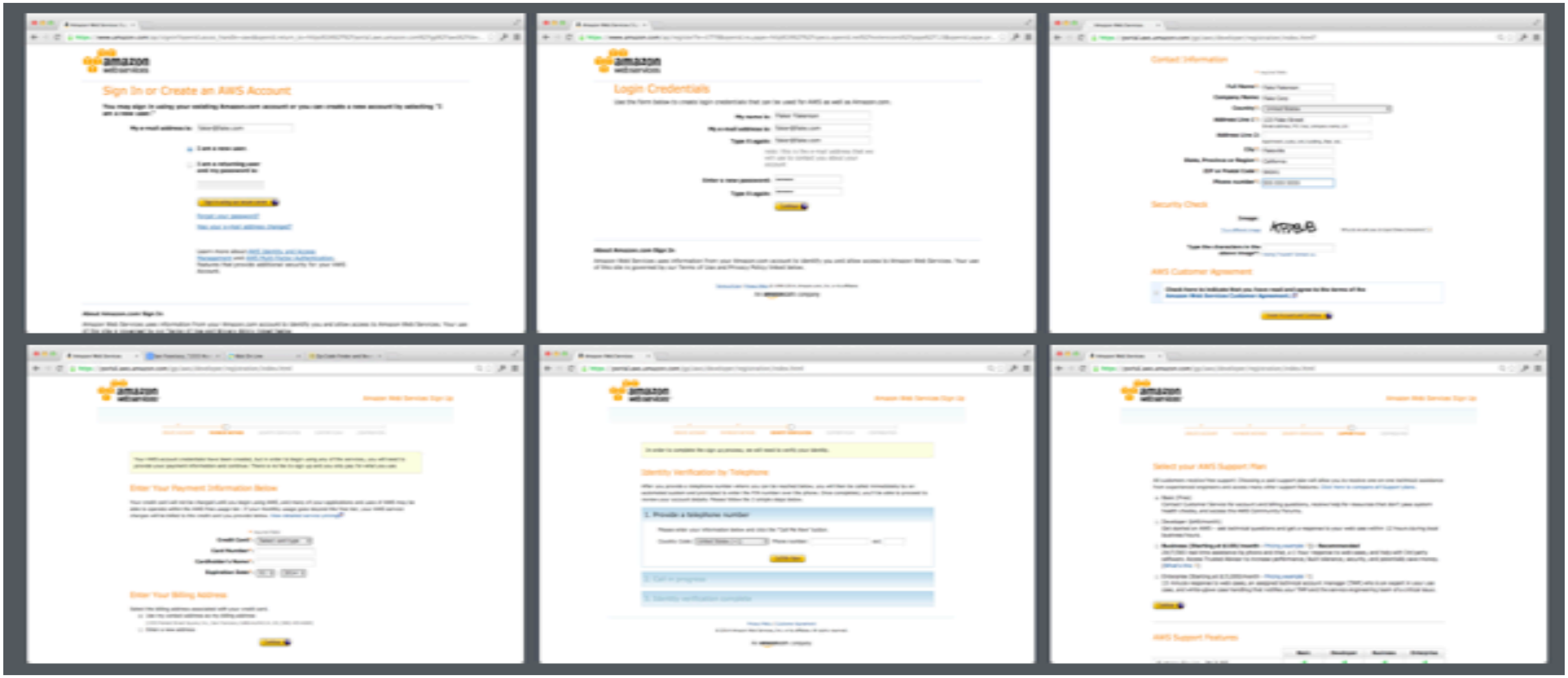


Sign In or Create an AWS Account

Login Credentials

Contact Information

Security Check

AWS Customer Agreement

Enter Your Payment Information Below

Enter Your Billing Address

Identity Verification by Telephone

1. Provide a telephone number

2. Call in progress

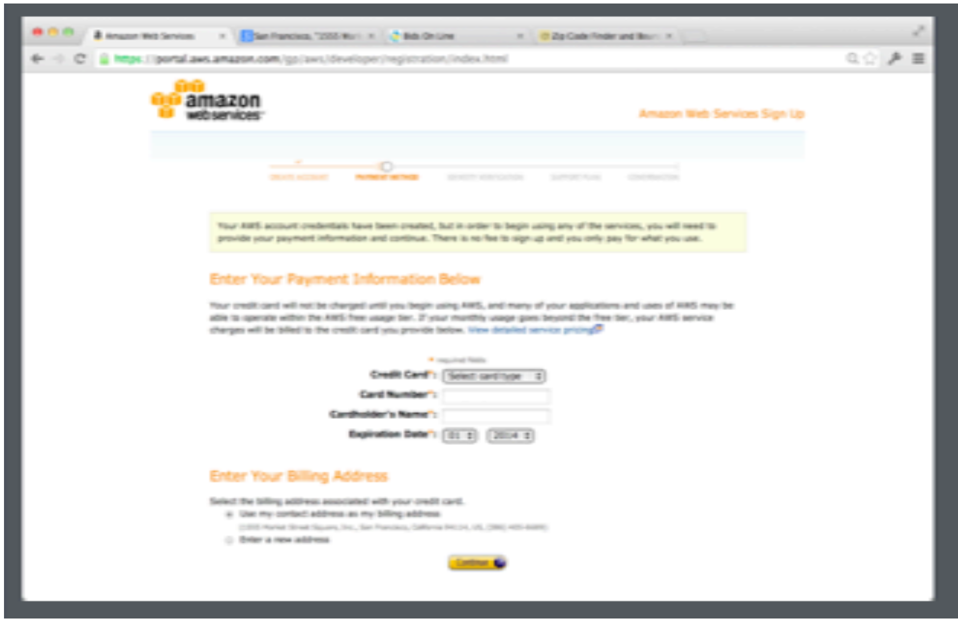
3. Identity verification complete

Select your AWS Support Plan

AWS Support Features

You’ll need to complete a few forms...

Two things of note



Your AWS account credentials have been created, but in order to begin using any of the services, you will need to provide your payment information and continue. There is no fee to sign up and you only pay for what you use.

Enter Your Payment Information Below

Your credit card will not be charged until you begin using AWS, and many of your applications and uses of AWS may be able to operate within the AWS free usage tier. If your monthly usage goes beyond the free tier, your AWS service charges will be billed to the credit card you provide below. View detailed service pricing

* required fields

Credit Card*: Select card type

Card Number*:

Cardholder's Name*:

Expiration Date*: 01 2014

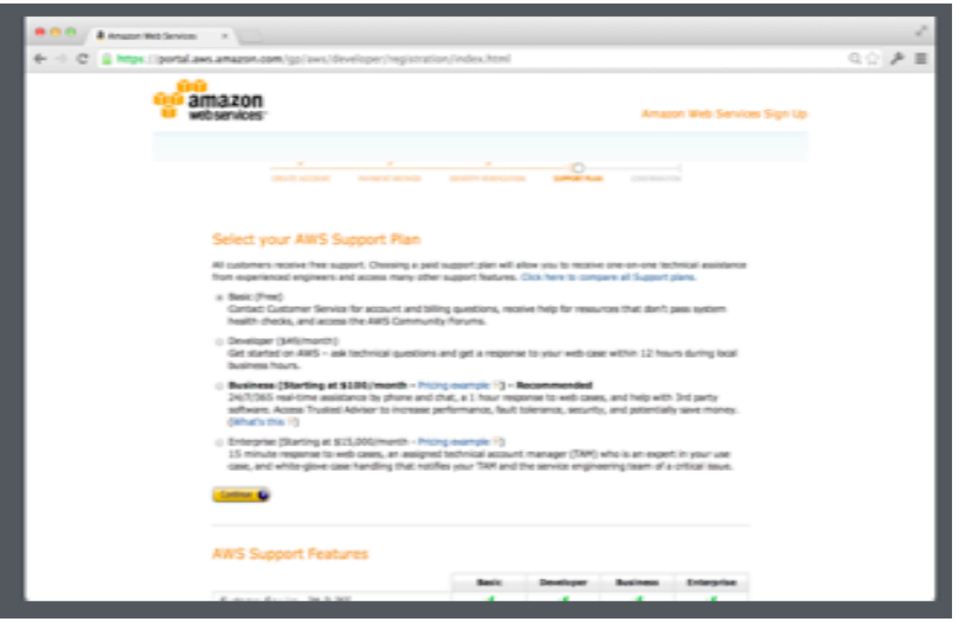
Enter Your Billing Address

Select the billing address associated with your credit card.

● Use my contact address as my billing address
[illegible]

○ Enter a new address

Credit card needed



Select your AWS Support Plan

All customers receive free support. Choosing a paid support plan will allow you to receive one-on-one technical assistance from experienced engineers and access many other support features. Click here to compare all Support plans.

● Basic (Free)
Contact Customer Service for account and billing questions, receive help for resources that don't pass system health checks, and access the AWS Community Forums.

○ Developer ($49/month)
Get started on AWS – ask technical questions and get a response to your web case within 12 hours during local business hours.

○ **Business (Starting at $100/month – Pricing example) – Recommended**
24/7/365 real-time assistance by phone and chat, a 1 hour response to web cases, and help with 3rd party software. Access Trusted Advisor to increase performance, fault tolerance, security, and potentially save money. (What's this ?)

○ Enterprise (Starting at $15,000/month – Pricing example)
15 minute response to web cases, an assigned technical account manager (TAM) who is an expert in your use case, and white-glove case handling that notifies your TAM and the service engineering team of a critical issue.

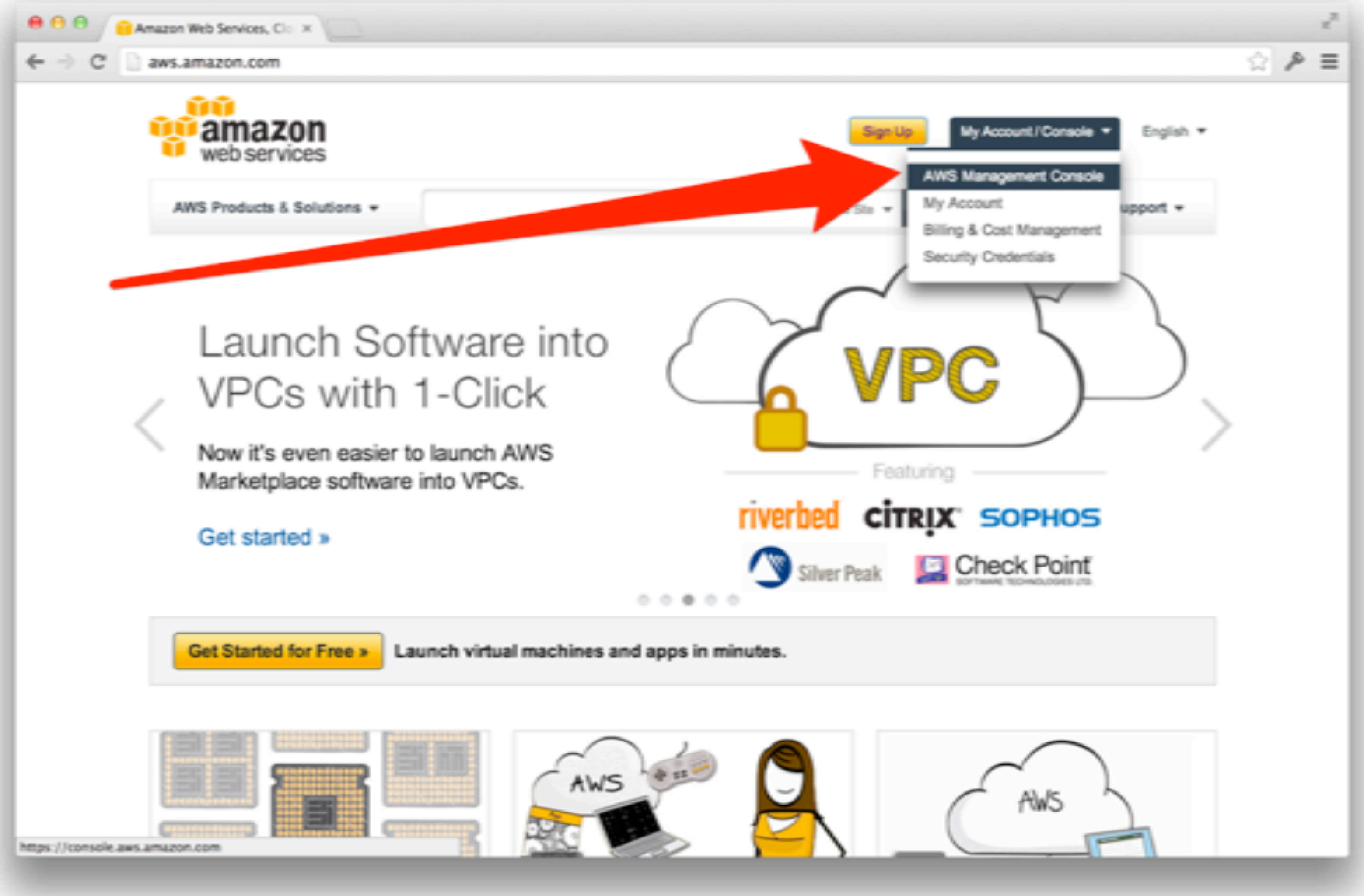
AWS Support Features

	Basic	Developer	Business	Enterprise
Customer Service - 24x7x365	✓	✓	✓	✓

Select Basic Support Plan
- it’s free!

You now have an AWS account!!!

Let’s log in

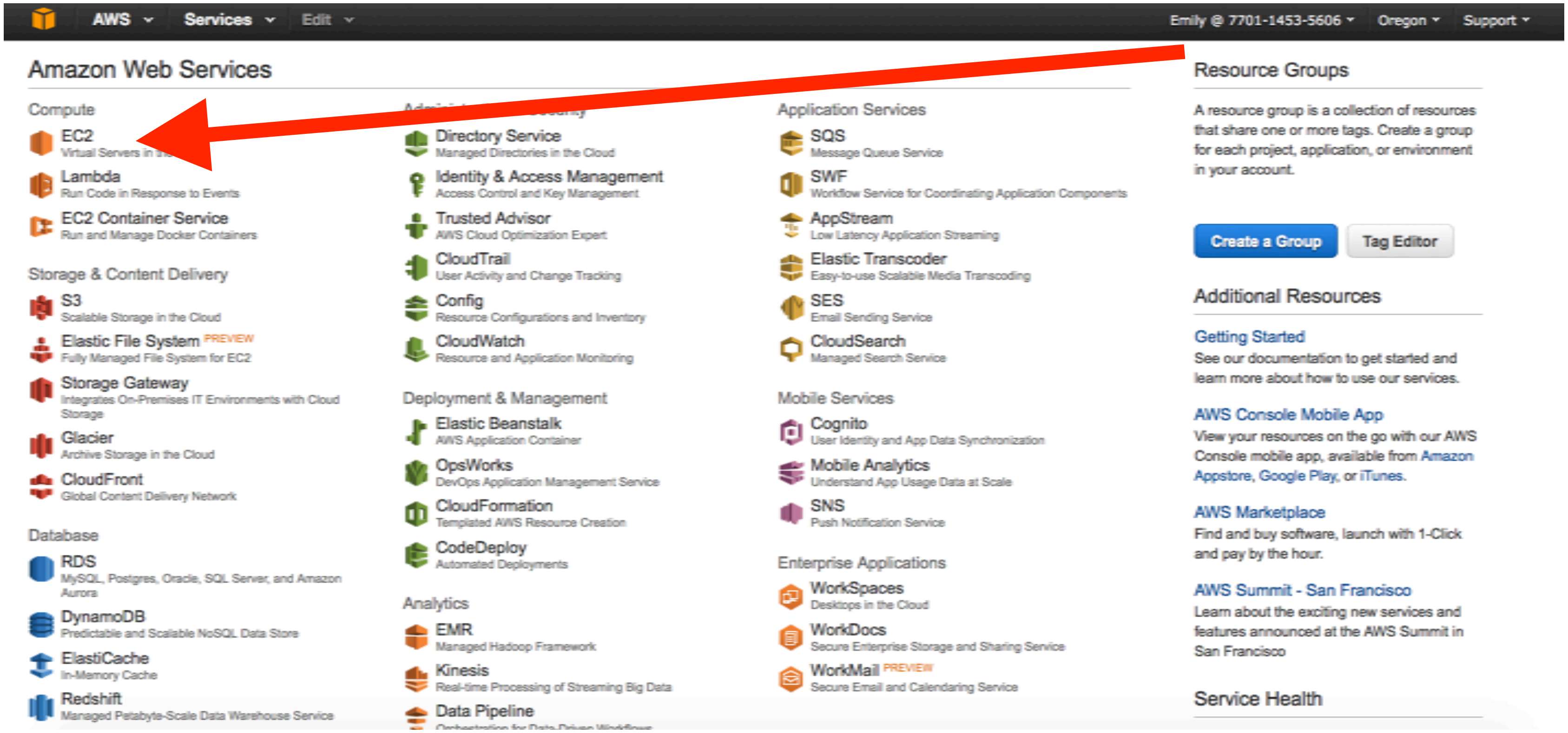


Launch Software into VPCs with 1-Click

Now it's even easier to launch AWS Marketplace software into VPCs.

Get started »

Get Started for Free » Launch virtual machines and apps in minutes.



AWS · Services · Edit

Emily @ 7701-1453-5606 · Oregon · Support

Amazon Web Services

Compute

EC2
Virtual Servers in the

Lambda
Run Code in Response to Events

EC2 Container Service
Run and Manage Docker Containers

Storage & Content Delivery

S3
Scalable Storage in the Cloud

Elastic File System PREVIEW
Fully Managed File System for EC2

Storage Gateway
Integrates On-Premises IT Environments with Cloud Storage

Glacier
Archive Storage in the Cloud

CloudFront
Global Content Delivery Network

Database

RDS
MySQL, Postgres, Oracle, SQL Server, and Amazon Aurora

DynamoDB
Predictable and Scalable NoSQL Data Store

ElastiCache
In-Memory Cache

Redshift
Managed Petabyte-Scale Data Warehouse Service

Administration & Security

Directory Service
Managed Directories in the Cloud

Identity & Access Management
Access Control and Key Management

Trusted Advisor
AWS Cloud Optimization Expert

CloudTrail
User Activity and Change Tracking

Config
Resource Configurations and Inventory

CloudWatch
Resource and Application Monitoring

Deployment & Management

Elastic Beanstalk
AWS Application Container

OpsWorks
DevOps Application Management Service

CloudFormation
Templated AWS Resource Creation

CodeDeploy
Automated Deployments

Analytics

EMR
Managed Hadoop Framework

Kinesis
Real-time Processing of Streaming Big Data

Data Pipeline
Orchestration for Data-Driven Workflows

Application Services

SQS
Message Queue Service

SWF
Workflow Service for Coordinating Application Components

AppStream
Low Latency Application Streaming

Elastic Transcoder
Easy-to-use Scalable Media Transcoding

SES
Email Sending Service

CloudSearch
Managed Search Service

Mobile Services

Cognito
User Identity and App Data Synchronization

Mobile Analytics
Understand App Usage Data at Scale

SNS
Push Notification Service

Enterprise Applications

WorkSpaces
Desktops in the Cloud

WorkDocs
Secure Enterprise Storage and Sharing Service

WorkMail PREVIEW
Secure Email and Calendaring Service

Resource Groups

A resource group is a collection of resources that share one or more tags. Create a group for each project, application, or environment in your account.

Create a Group · Tag Editor

Additional Resources

Getting Started
See our documentation to get started and learn more about how to use our services.

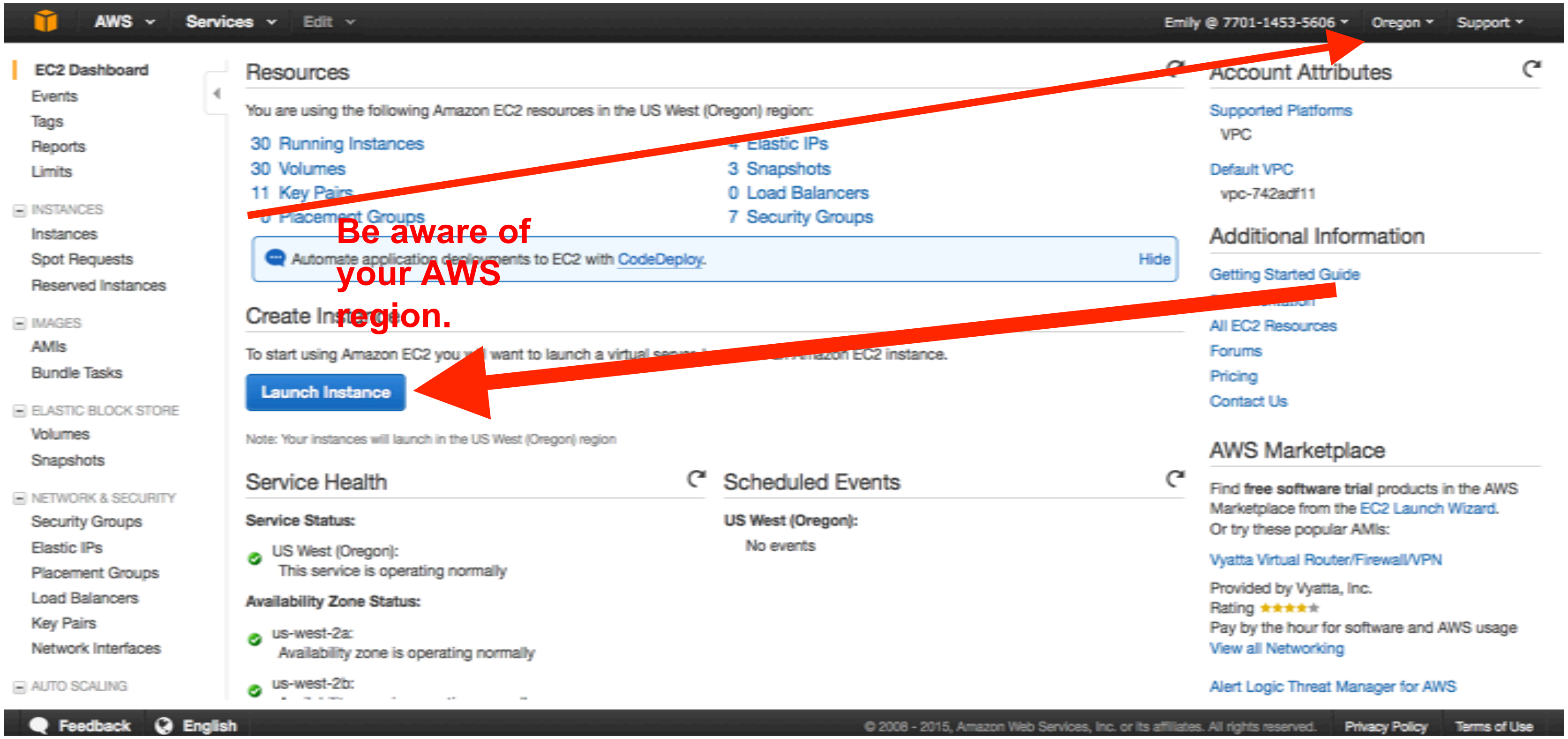
AWS Console Mobile App
View your resources on the go with our AWS Console mobile app, available from Amazon Appstore, Google Play, or iTunes.

AWS Marketplace
Find and buy software, launch with 1-Click and pay by the hour.

AWS Summit - San Francisco
Learn about the exciting new services and features announced at the AWS Summit in San Francisco

Service Health

You can do a lot of different things with AWS. For now, let’s just start a virtual machine. Click on EC2 (“Elastic Cloud Compute”)



Be aware of your AWS region.

Resources

You are using the following Amazon EC2 resources in the US West (Oregon) region:

30 Running Instances	4 Elastic IPs
30 Volumes	3 Snapshots
11 Key Pairs	0 Load Balancers
0 Placement Groups	7 Security Groups

Automate application deployments to EC2 with CodeDeploy.

Create Instance

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

Note: Your instances will launch in the US West (Oregon) region

Service Health

Service Status:

US West (Oregon):
This service is operating normally

Availability Zone Status:

us-west-2a:
Availability zone is operating normally

us-west-2b:

Scheduled Events

US West (Oregon):
No events

Account Attributes

Supported Platforms
VPC

Default VPC
vpc-742adf11

Additional Information

Getting Started Guide
Documentation
All EC2 Resources
Forums
Pricing
Contact Us

AWS Marketplace

Find **free software trial** products in the AWS Marketplace from the EC2 Launch Wizard.
Or try these popular AMIs:

Vyatta Virtual Router/Firewall/VPN
Provided by Vyatta, Inc.
Rating ★★★★★
Pay by the hour for software and AWS usage
View all Networking

Alert Logic Threat Manager for AWS

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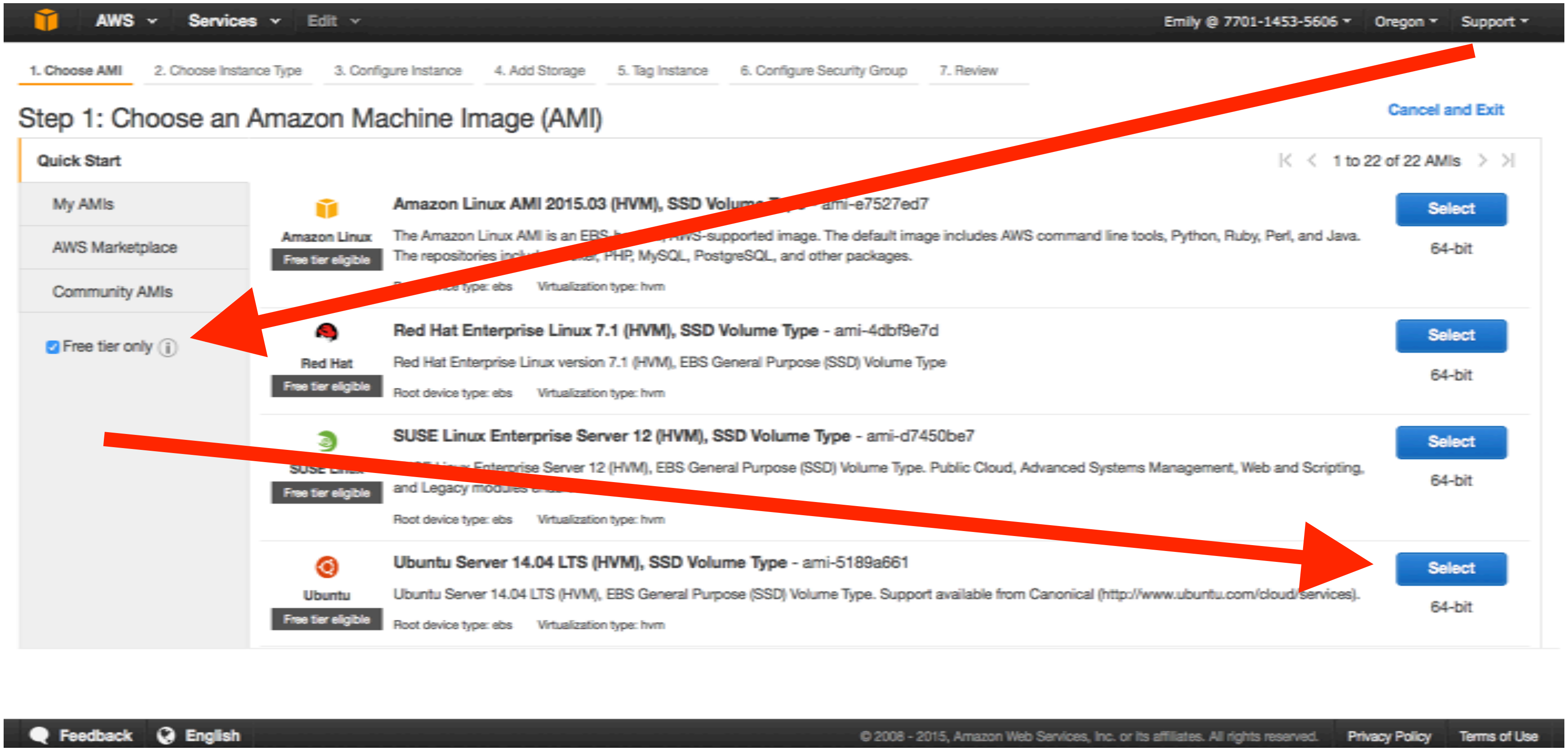
Click on “Launch Instance”. It’s worth noting that AWS has different regions, and that you can launch an instance in any of them. (So if you’ve always wanted a server in Brazil or Japan, this is your chance!) Your choice will affect both latency and price - by default, it’s best to go with Oregon, California, or Virginia.



Step 1: Choose an Amazon Machine Image (AMI)

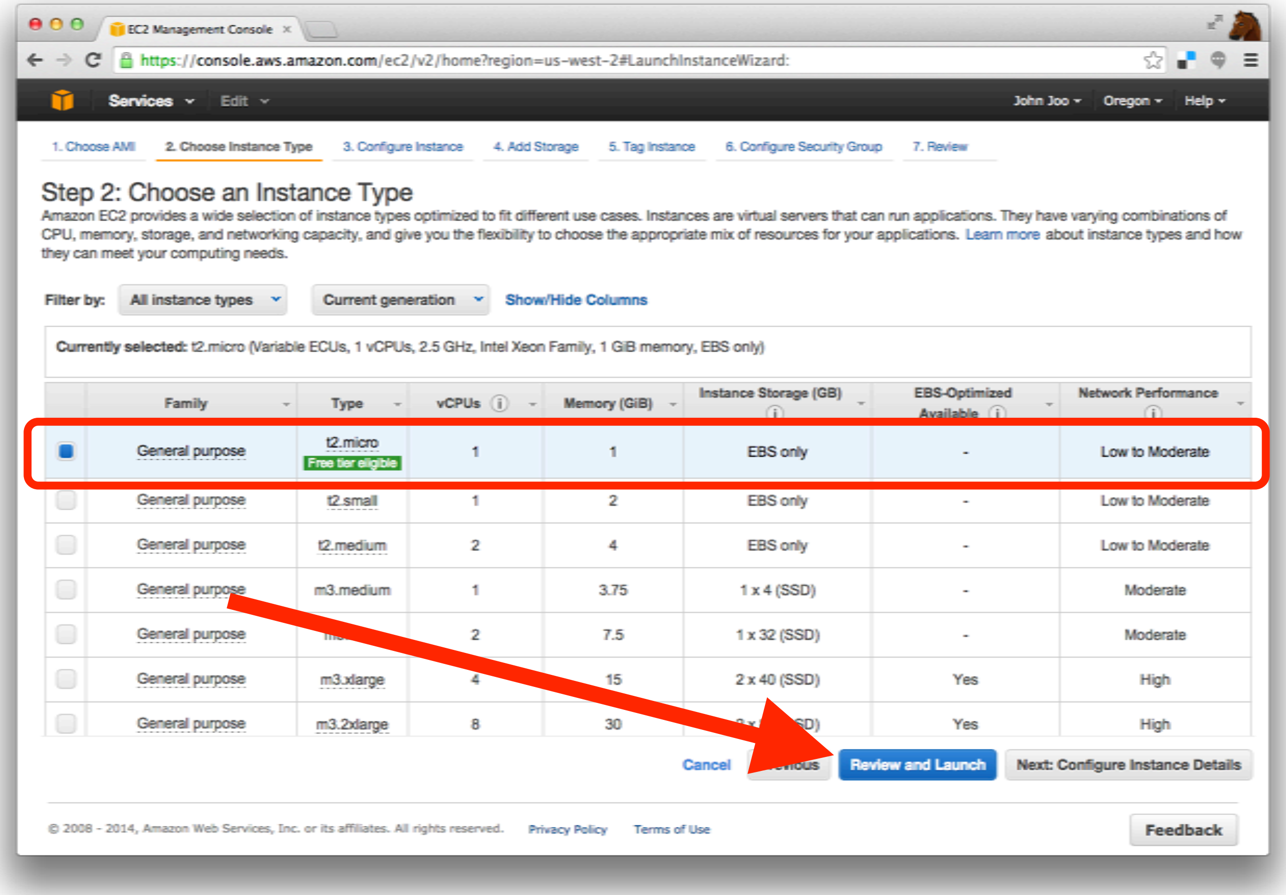
Amazon Linux AMI 2015.03 (HVM), SSD Volume Type - ami-e7527ed7
The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.
Root device type: ebs Virtualization type: hvm

Red Hat Enterprise Linux 7.1 (HVM), SSD Volume Type - ami-4dbf9e7d
Red Hat Enterprise Linux version 7.1 (HVM), EBS General Purpose (SSD) Volume Type
Root device type: ebs Virtualization type: hvm

SUSE Linux Enterprise Server 12 (HVM), SSD Volume Type - ami-d7450be7
SUSE Linux Enterprise Server 12 (HVM), EBS General Purpose (SSD) Volume Type. Public Cloud, Advanced Systems Management, Web and Scripting, and Legacy modules enabled.
Root device type: ebs Virtualization type: hvm

Ubuntu Server 14.04 LTS (HVM), SSD Volume Type - ami-5189a661
Ubuntu Server 14.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services).
Root device type: ebs Virtualization type: hvm

Now it's time to select the image for your VM. For this tutorial, we'll use Ubuntu Server 14.04 LTS (HVM). Be sure to select the 64-bit.
If you are worried about price: filter with the Free tier only box.



Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. Learn more about instance types and how they can meet your computing needs.

Filter by: All instance types | Current generation | Show/Hide Columns

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
■	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate
□	General purpose	t2.small	1	2	EBS only	-	Low to Moderate
□	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate
□	General purpose	m3.medium	1	3.75	1 x 4 (SSD)	-	Moderate
□	General purpose	[illegible]	2	7.5	1 x 32 (SSD)	-	Moderate
□	General purpose	m3.xlarge	4	15	2 x 40 (SSD)	Yes	High
□	General purpose	m3.2xlarge	8	30	[illegible]	Yes	High

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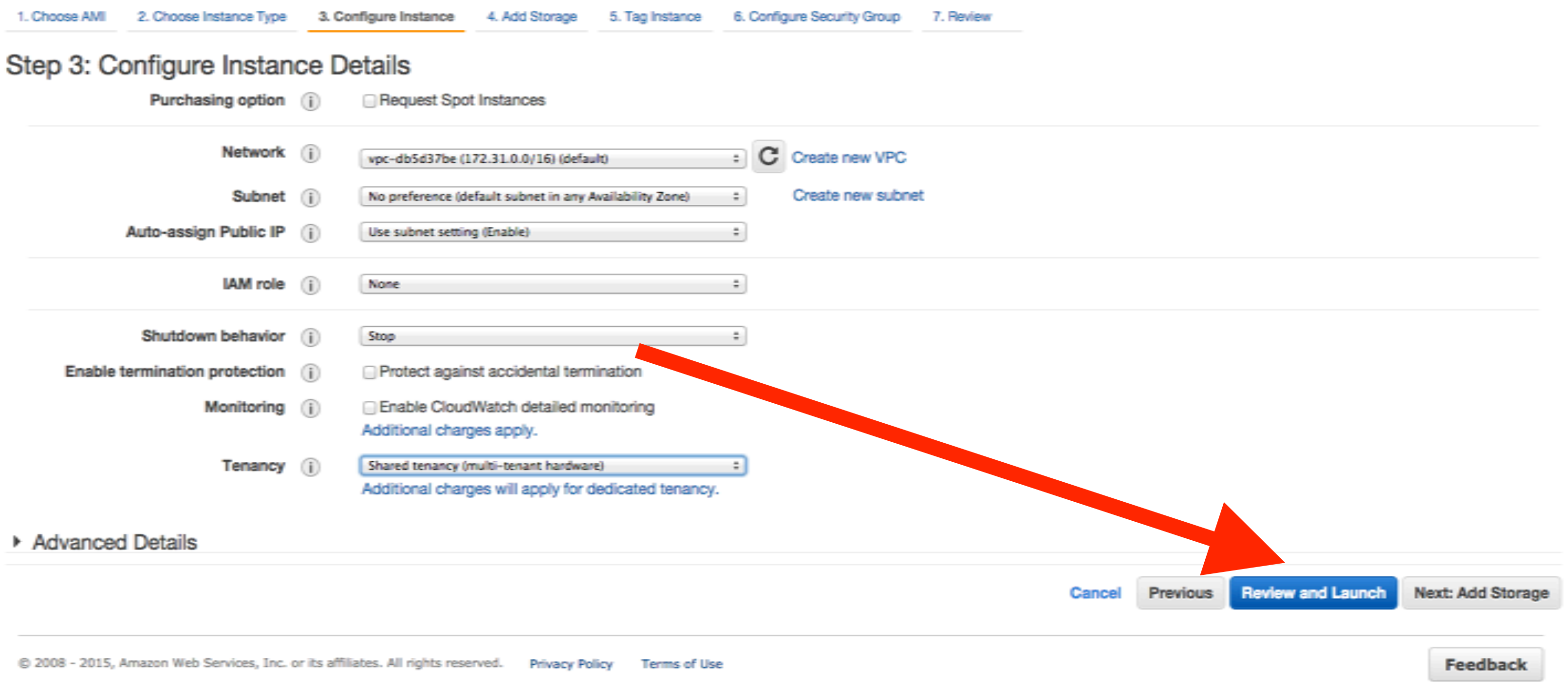
Now choose your instance size. You should use the free option to start: t2.micro. That’s what we’ll use for this tutorial. (you may need to configure the instance details). Click on “Review and Launch”



Step 3: Configure Instance Details

Purchasing option ☐ Request Spot Instances

Network: vpc-db5d37be (172.31.0.0/16) (default) — Create new VPC

Subnet: No preference (default subnet in any Availability Zone) — Create new subnet

Auto-assign Public IP: Use subnet setting (Enable)

IAM role: None

Shutdown behavior: Stop

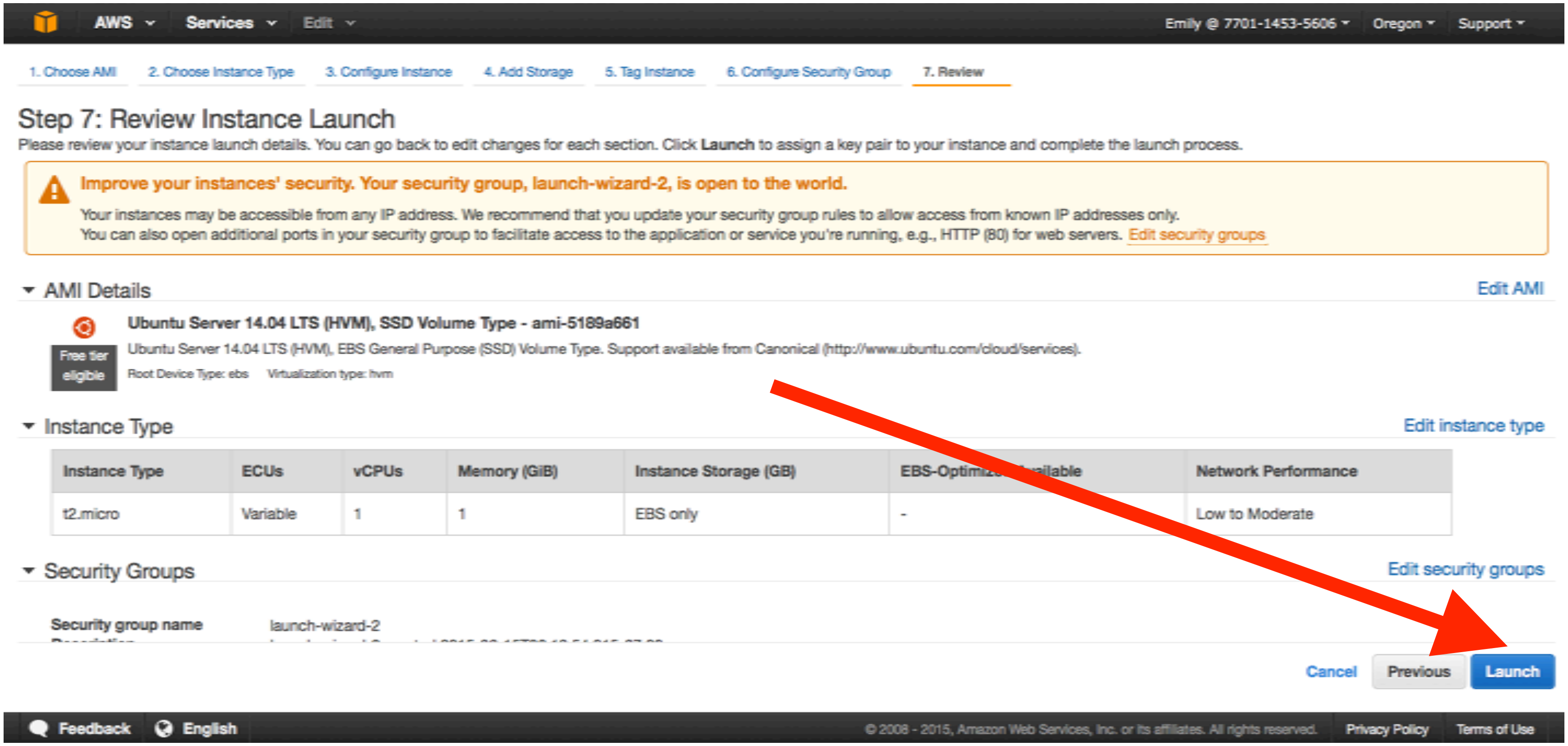
Enable termination protection ☐ Protect against accidental termination

Monitoring ☐ Enable CloudWatch detailed monitoring
Additional charges apply.

Tenancy: Shared tenancy (multi-tenant hardware)
Additional charges will apply for dedicated tenancy.

▸ Advanced Details

You may need to launch into a VPC (skip this step if this screen doesn't show up)



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.

Improve your instances' security. Your security group, launch-wizard-2, is open to the world.

Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only.
You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. Edit security groups

AMI Details

Ubuntu Server 14.04 LTS (HVM), SSD Volume Type - ami-5189a661

Ubuntu Server 14.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services).

Root Device Type: ebs Virtualization type: hvm

Instance Type

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.micro	Variable	1	1	EBS only	-	Low to Moderate

Security Groups

Security group name launch-wizard-2

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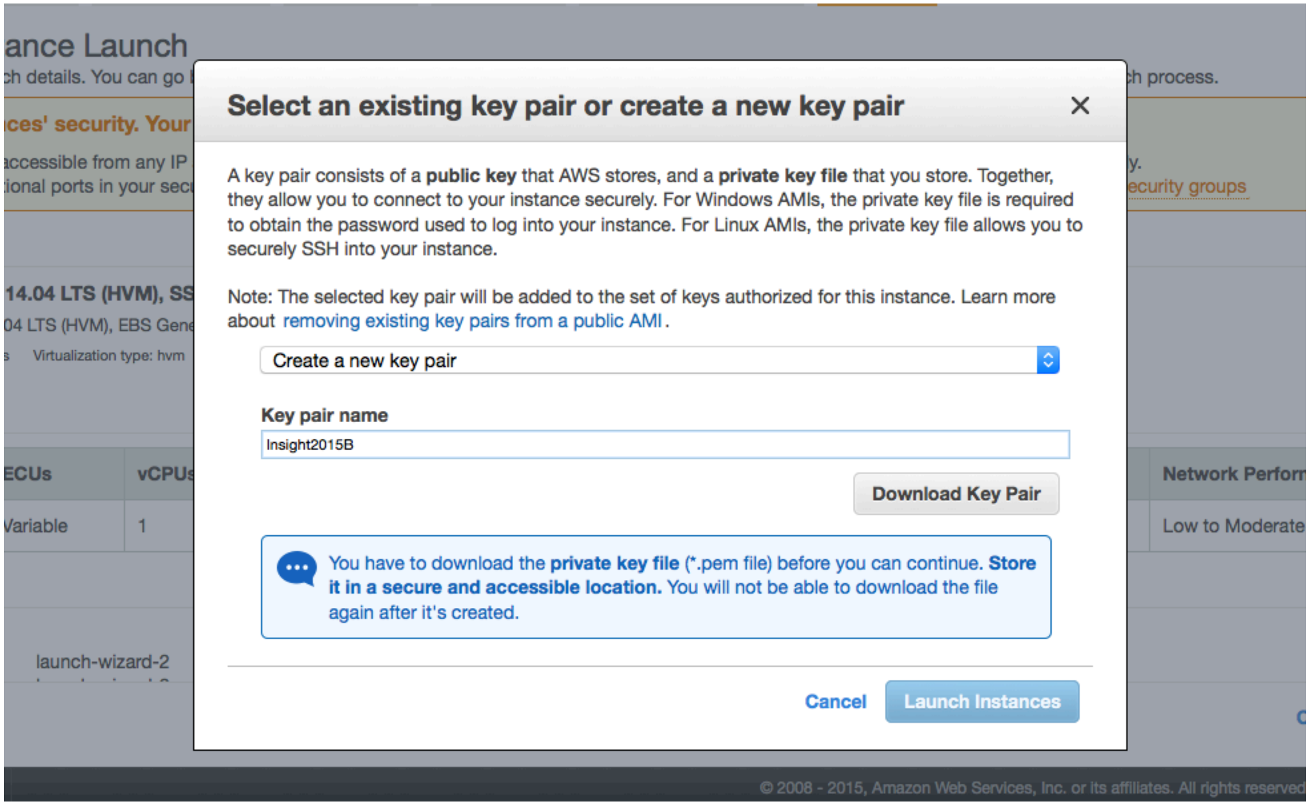
Launch!



Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

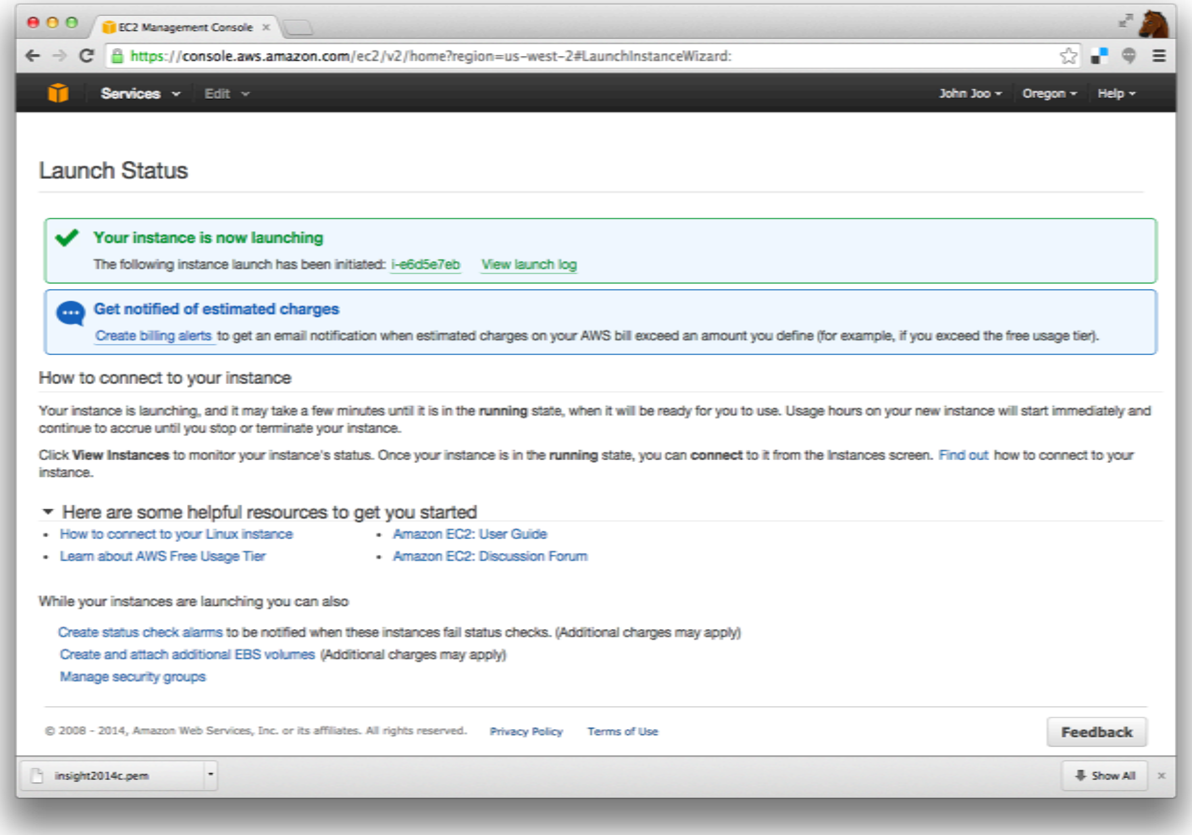
Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about removing existing key pairs from a public AMI.

Create a new key pair

Key pair name: Insight2015B

You have to download the **private key file** (*.pem file) before you can continue. **Store it in a secure and accessible location.** You will not be able to download the file again after it's created.

AWS will prompt you to create a key pair for your instance. (You'll need to ssh into the machine). Choose 'Create a new key pair', name it (e.g. 'Insight2015B'), and click 'Download Key Pair'. Then click 'Launch Instances'.



EC2 Management Console
https://console.aws.amazon.com/ec2/v2/home?region=us-west-2#LaunchInstanceWizard:
Services
Edit
John Joo
Oregon
Help

Launch Status

✓ **Your instance is now launching**

The following instance launch has been initiated: i-e6d5e7eb View launch log

Get notified of estimated charges

Create billing alerts to get an email notification when estimated charges on your AWS bill exceed an amount you define (for example, if you exceed the free usage tier).

How to connect to your instance

Your instance is launching, and it may take a few minutes until it is in the **running** state, when it will be ready for you to use. Usage hours on your new instance will start immediately and continue to accrue until you stop or terminate your instance.

Click **View Instances** to monitor your instance's status. Once your instance is in the **running** state, you can **connect** to it from the Instances screen. Find out how to connect to your instance.

▾ Here are some helpful resources to get you started

- How to connect to your Linux instance
- Learn about AWS Free Usage Tier
- Amazon EC2: User Guide
- Amazon EC2: Discussion Forum

While your instances are launching you can also

Create status check alarms to be notified when these instances fail status checks. (Additional charges may apply)
Create and attach additional EBS volumes (Additional charges may apply)
Manage security groups

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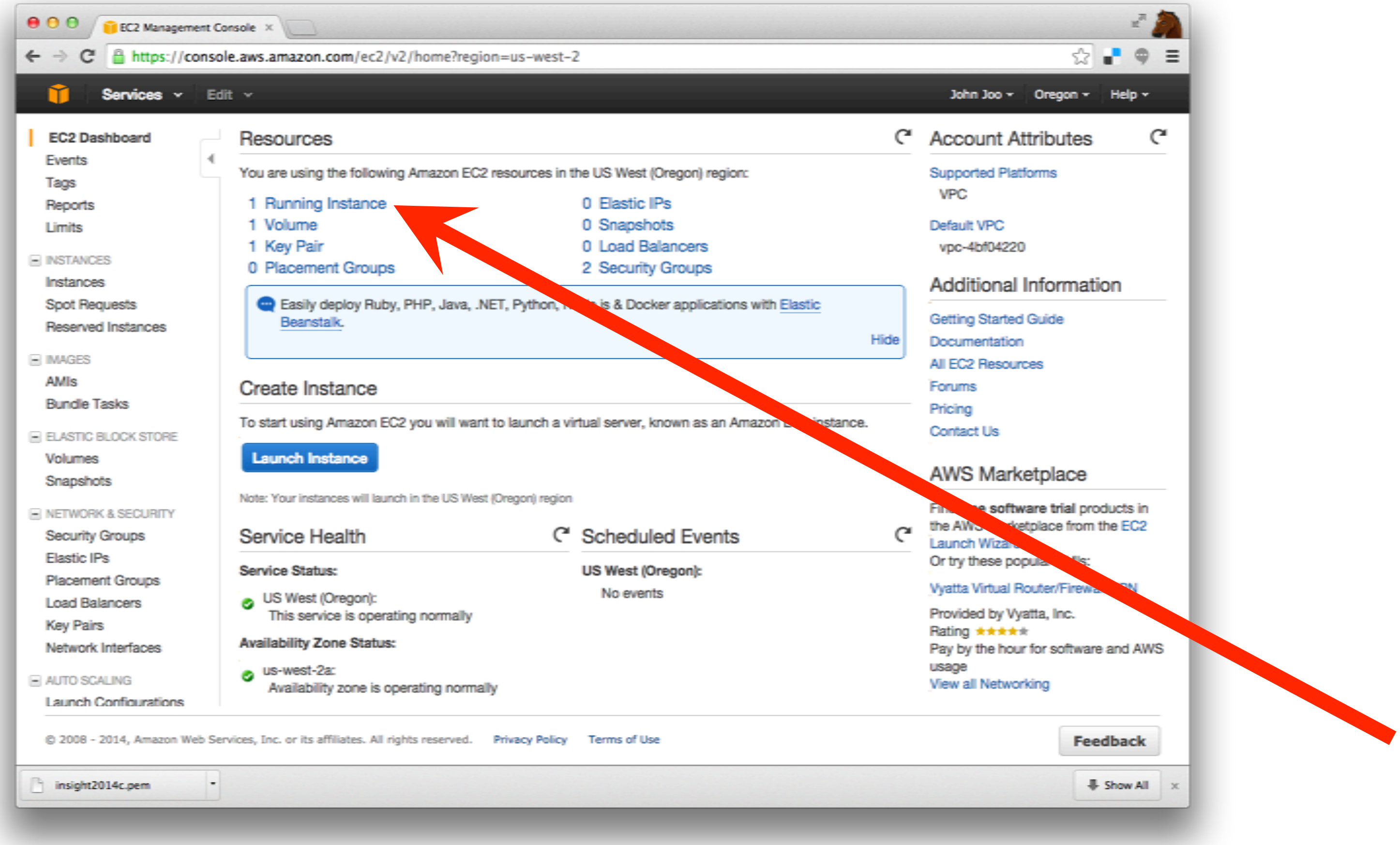
Congratulations! Your AWS instance is now spinning up! Let’s log into it. Click on orange box in upper left corner, and then again on EC2



Resources

You are using the following Amazon EC2 resources in the US West (Oregon) region:

1 Running Instance	0 Elastic IPs
1 Volume	0 Snapshots
1 Key Pair	0 Load Balancers
0 Placement Groups	2 Security Groups

Easily deploy Ruby, PHP, Java, .NET, Python, Node.js & Docker applications with Elastic Beanstalk.

Create Instance

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

Note: Your instances will launch in the US West (Oregon) region

Service Health

Service Status:

US West (Oregon):
This service is operating normally

Availability Zone Status:

us-west-2a:
Availability zone is operating normally

Scheduled Events

US West (Oregon):
No events

Account Attributes

Supported Platforms
VPC

Default VPC
vpc-4bf04220

Additional Information

Getting Started Guide
Documentation
All EC2 Resources
Forums
Pricing
Contact Us

AWS Marketplace

Find free software trial products in the AWS Marketplace from the EC2 Launch Wizard.
Or try these popular AMIs:

Vyatta Virtual Router/Firewall/VPN
Provided by Vyatta, Inc.
Rating ★★★★★
Pay by the hour for software and AWS usage
View all Networking

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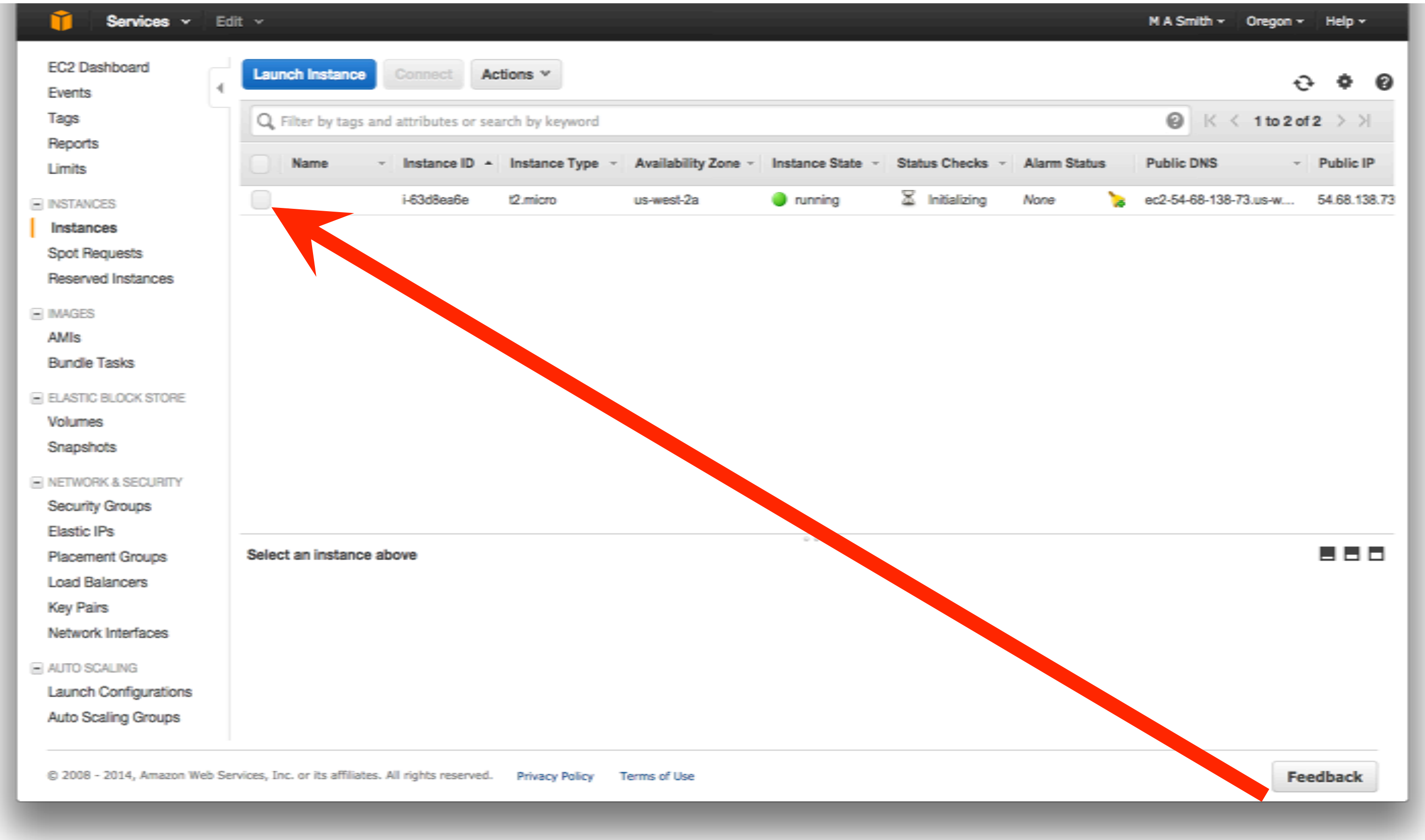
You should now see “1 Running Instance”. Click on it.



	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP
□		i-63d8ea6e	t2.micro	us-west-2a	● running	Initializing	None	ec2-54-68-138-73.us-w...	54.68.138.73

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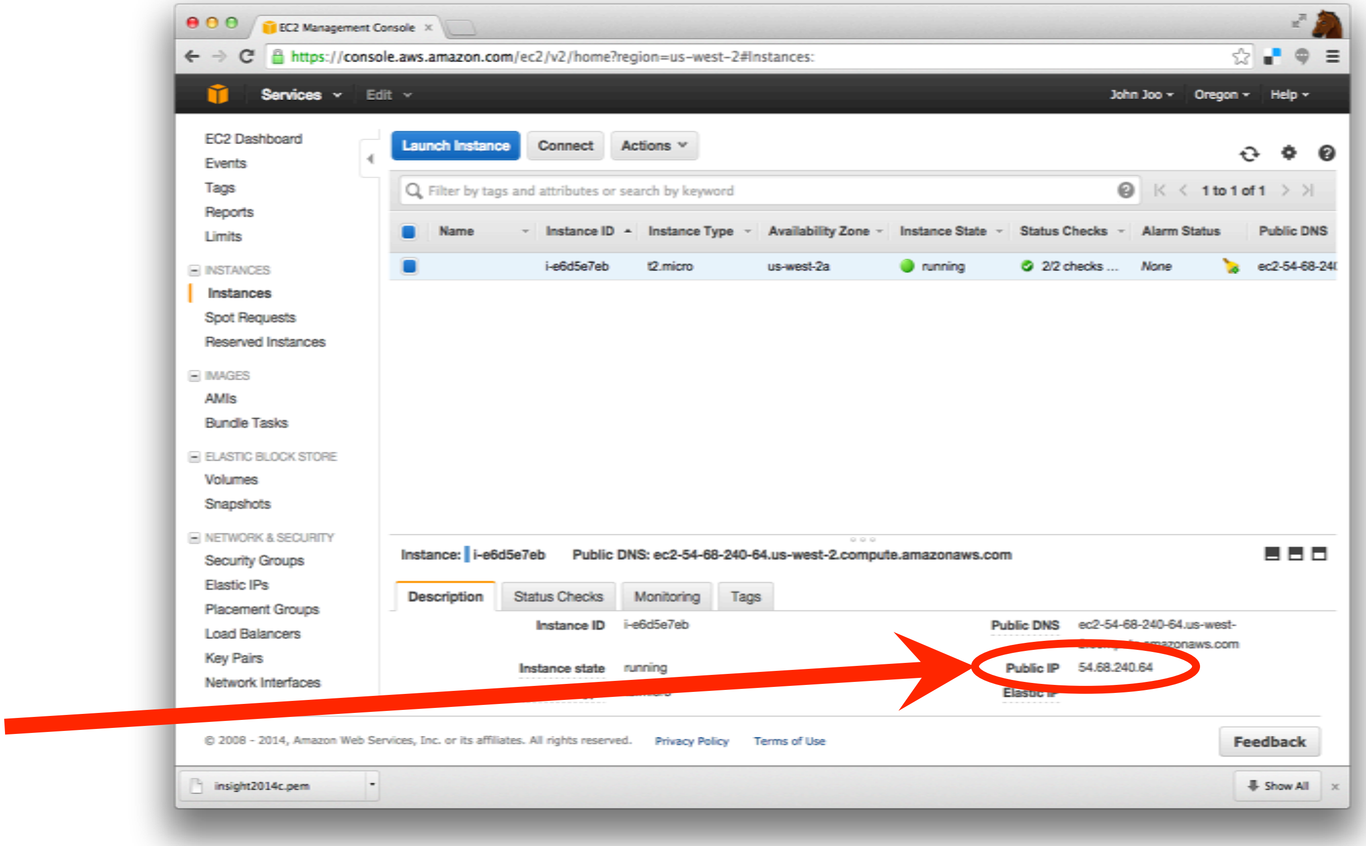
And click again….



https://console.aws.amazon.com/ec2/v2/home?region=us-west-2#Instances:

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS
	i-e6d5e7eb	t2.micro	us-west-2a	● running	✓ 2/2 checks ...	None	ec2-54-68-240

Instance: i-e6d5e7eb   Public DNS: ec2-54-68-240-64.us-west-2.compute.amazonaws.com

Instance ID	i-e6d5e7eb	Public DNS	ec2-54-68-240-64.us-west-2.compute.amazonaws.com
Instance state	running	Public IP	54.68.240.64
		Elastic IP	

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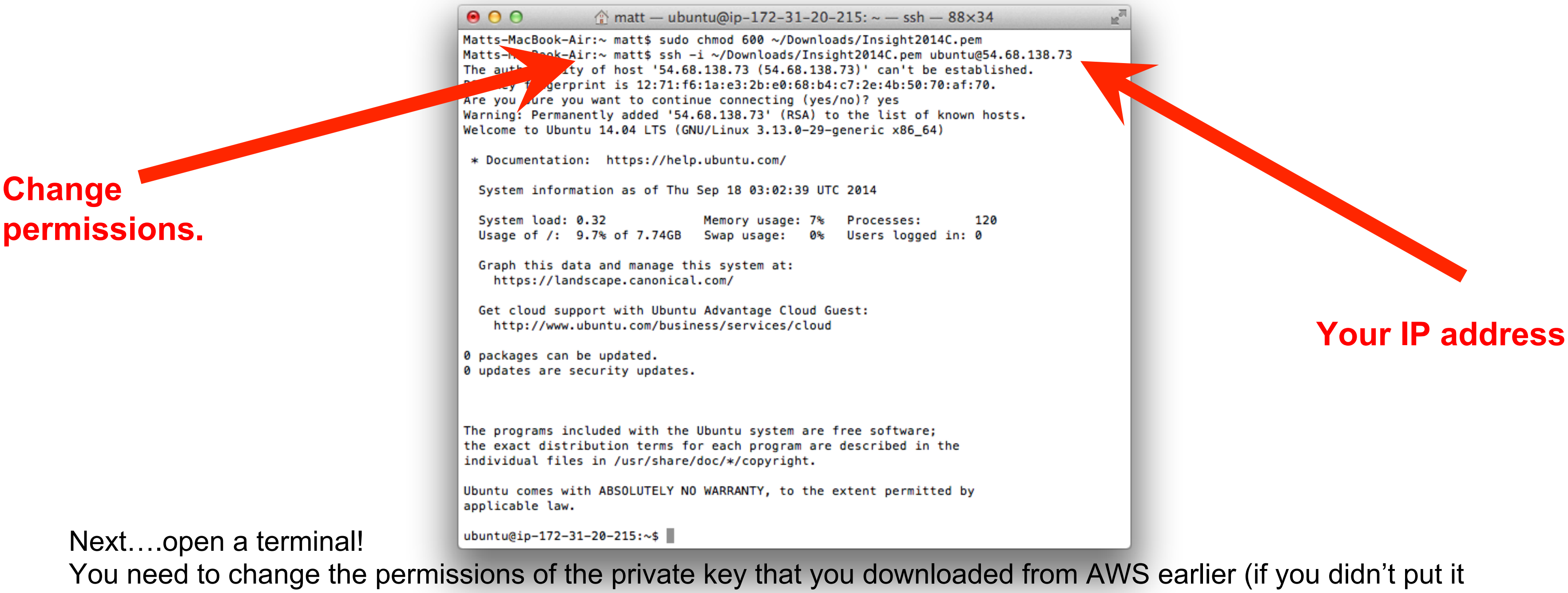
You should now be able to see the public IP address of your VM. This is the endpoint we're going to use to ssh into the machine.



matt — ubuntu@ip-172-31-20-215: ~ — ssh — 88×34

```
Matts-MacBook-Air:~ matt$ sudo chmod 600 ~/Downloads/Insight2014C.pem
Matts-MacBook-Air:~ matt$ ssh -i ~/Downloads/Insight2014C.pem ubuntu@54.68.138.73
The authenticity of host '54.68.138.73 (54.68.138.73)' can't be established.
RSA key fingerprint is 12:71:f6:1a:e3:2b:e0:68:b4:c7:2e:4b:50:70:af:70.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '54.68.138.73' (RSA) to the list of known hosts.
Welcome to Ubuntu 14.04 LTS (GNU/Linux 3.13.0-29-generic x86_64)

 * Documentation:  https://help.ubuntu.com/

  System information as of Thu Sep 18 03:02:39 UTC 2014

  System load: 0.32               Memory usage: 7%   Processes:       120
  Usage of /:  9.7% of 7.74GB     Swap usage:   0%   Users logged in: 0

  Graph this data and manage this system at:
    https://landscape.canonical.com/

  Get cloud support with Ubuntu Advantage Cloud Guest:
    http://www.ubuntu.com/business/services/cloud

0 packages can be updated.
0 updates are security updates.



The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

ubuntu@ip-172-31-20-215:~$ 
```

Next….open a terminal!

You need to change the permissions of the private key that you downloaded from AWS earlier (if you didn't put it somewhere special, it's probably in ~/Desktop)

```
> sudo chmod 600 <path to your key>.
```

Now ssh into the machine. Use the command:

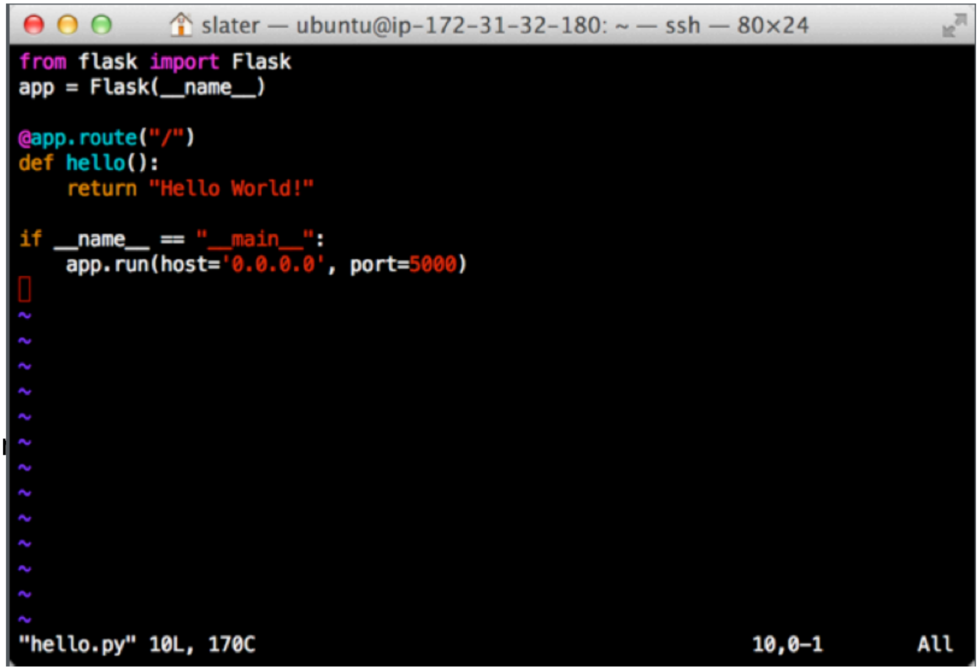
```
> ssh -i <path to your key> ubuntu@<your VM's public IP address>
```

If prompted "Are you sure that you want to continue?", enter "yes".

After you’re ssh’ed in, let’s set up a simple Flask app.
First, we’ll need to install a few things. Run the following commands, entering “yes” if prompted.

```
> sudo apt-get update
> sudo apt-get install python-pip python-dev build-essential
> sudo pip install flask
```

Using vim (or pico or emacs or whatever), write the following to the file hello.py:



slater — ubuntu@ip-172-31-32-180: ~ — ssh — 80×24

```
from flask import Flask
app = Flask(__name__)

@app.route("/")
def hello():
    return "Hello World!"

if __name__ == "__main__":
    app.run(host='0.0.0.0', port=5000)

~
~
~
~
~
~
~
~
~
~
~
~
~
"hello.py" 10L, 170C                                          10,0-1        All
```

Now exit and run the co

Intermission: Tips and tricks for getting your SQL database (if you have one) on AWS:

Do you need to install MySQL on your AWS instance? Follow these steps!

Install mysql on your AWS server instance:

```
sudo apt-get install mysql-server
sudo apt-get install mysql-client
```

On your local machine, (or wherever you have your DB initially):

```
mysqldump -u root -p [password] [database name] > dumpFileName.sql
```

note that depending on how you installed mysql, on a mac you might need to specify the path:

```
/usr/local/mysql/bin/mysqldump .. etc..
```

Copy this file to AWS:

```
scp -i <path to your key> dumpFileName.sql ubuntu@<your VM's public IP address>:.
```

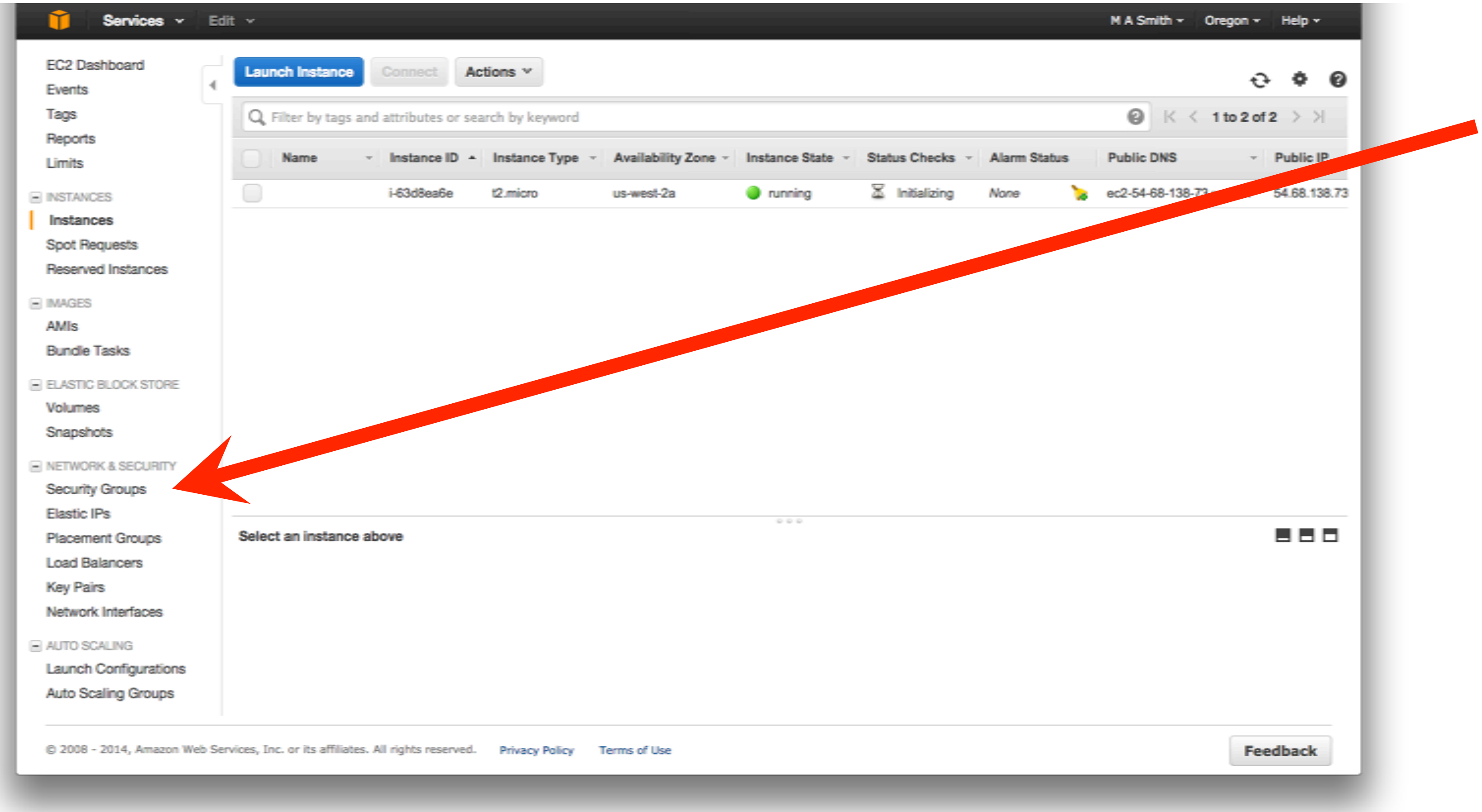
in your AWS instance (after creating your [database name]):

```
> mysql
   > create database [database name]
mysql -u root -p [password] [database name] < dumpFileName.sql
```

Unrelated pro tip: In case your server stops running properly:

```
sudo service mysql restart
```

Before you can reach your machine on port 5000, you'll need to open it in your AWS security group settings.



Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP
	i-63d8ea6e	t2.micro	us-west-2a	● running	Initializing	None	ec2-54-68-138-73	54.68.138.73

Select an instance above

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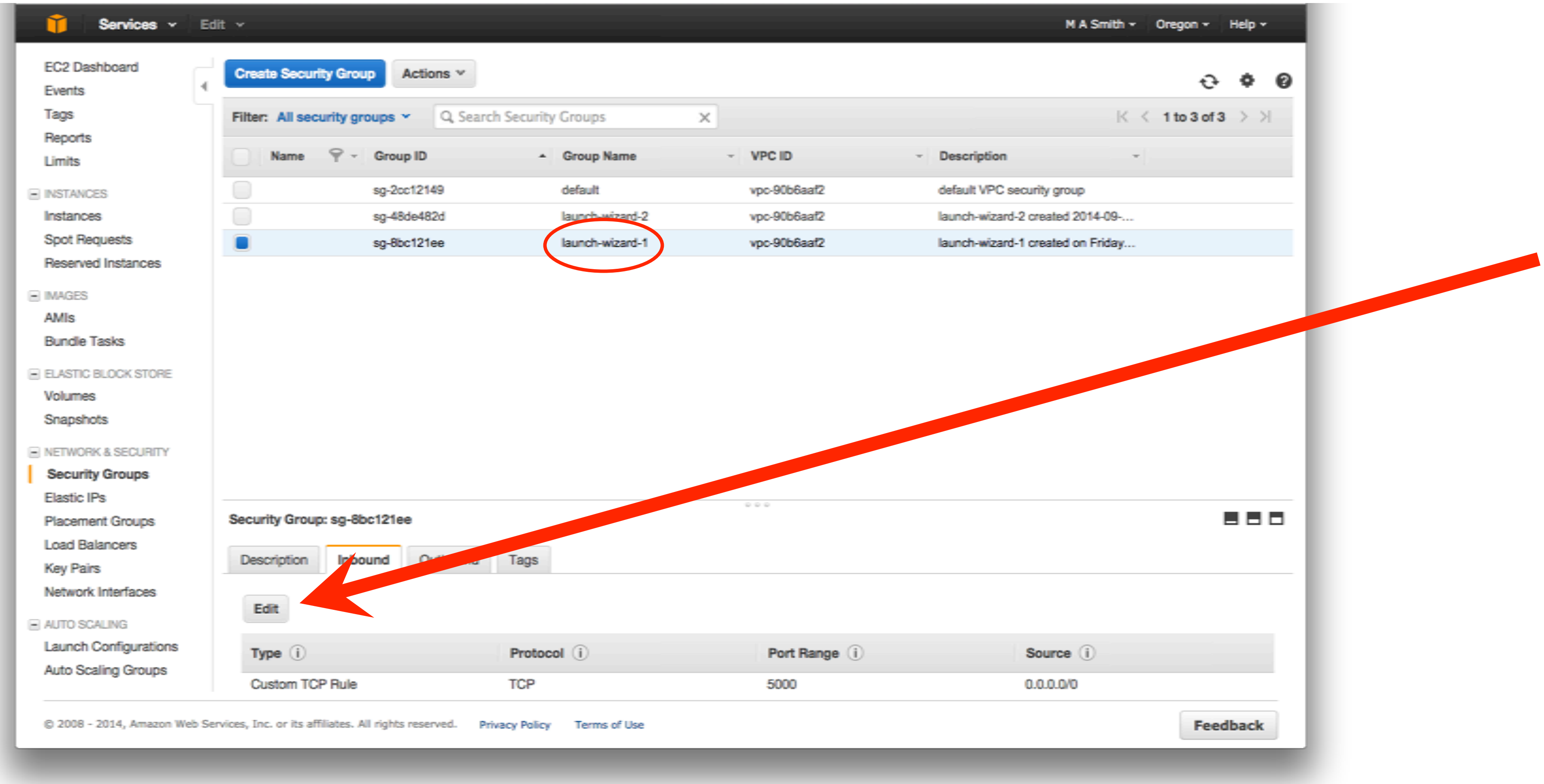

Name	Group ID	Group Name	VPC ID	Description
	sg-2cc12149	default	vpc-90b6aaf2	default VPC security group
	sg-48de482d	launch-wizard-2	vpc-90b6aaf2	launch-wizard-2 created 2014-09-...
	sg-8bc121ee	launch-wizard-1	vpc-90b6aaf2	launch-wizard-1 created on Friday...

Security Group: sg-8bc121ee

Type	Protocol	Port Range	Source
Custom TCP Rule	TCP	5000	0.0.0.0/0

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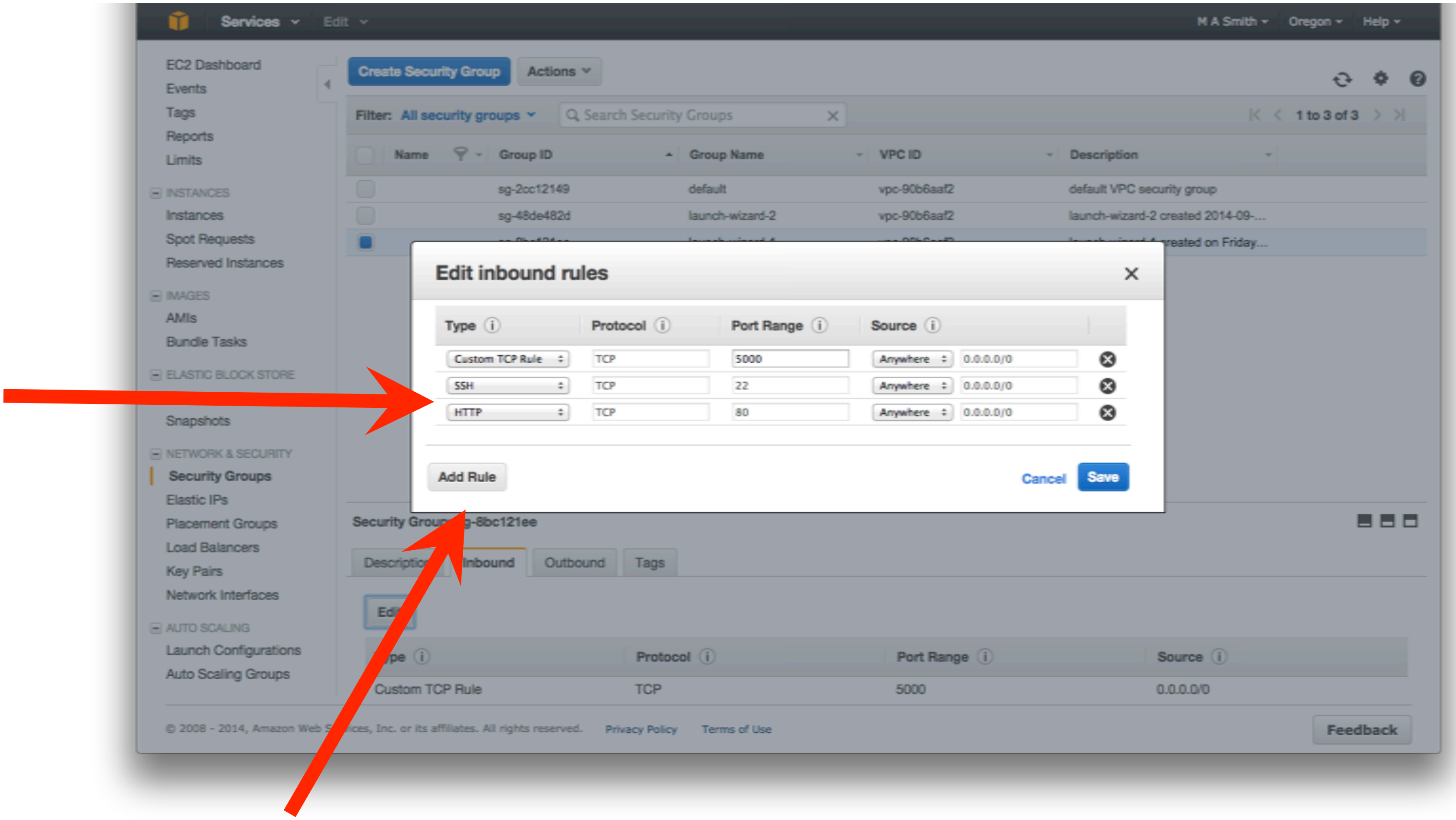
Click Inbound, then Edit



Name	Group ID	Group Name	VPC ID	Description
	sg-2cc12149	default	vpc-90b6aaf2	default VPC security group
	sg-48de482d	launch-wizard-2	vpc-90b6aaf2	launch-wizard-2 created 2014-09-...
				reated on Friday...

Edit inbound rules

Type	Protocol	Port Range	Source	
Custom TCP Rule	TCP	5000	Anywhere	0.0.0.0/0
SSH	TCP	22	Anywhere	0.0.0.0/0
HTTP	TCP	80	Anywhere	0.0.0.0/0

Security Group: sg-8bc121ee

Type	Protocol	Port Range	Source
Custom TCP Rule	TCP	5000	0.0.0.0/0

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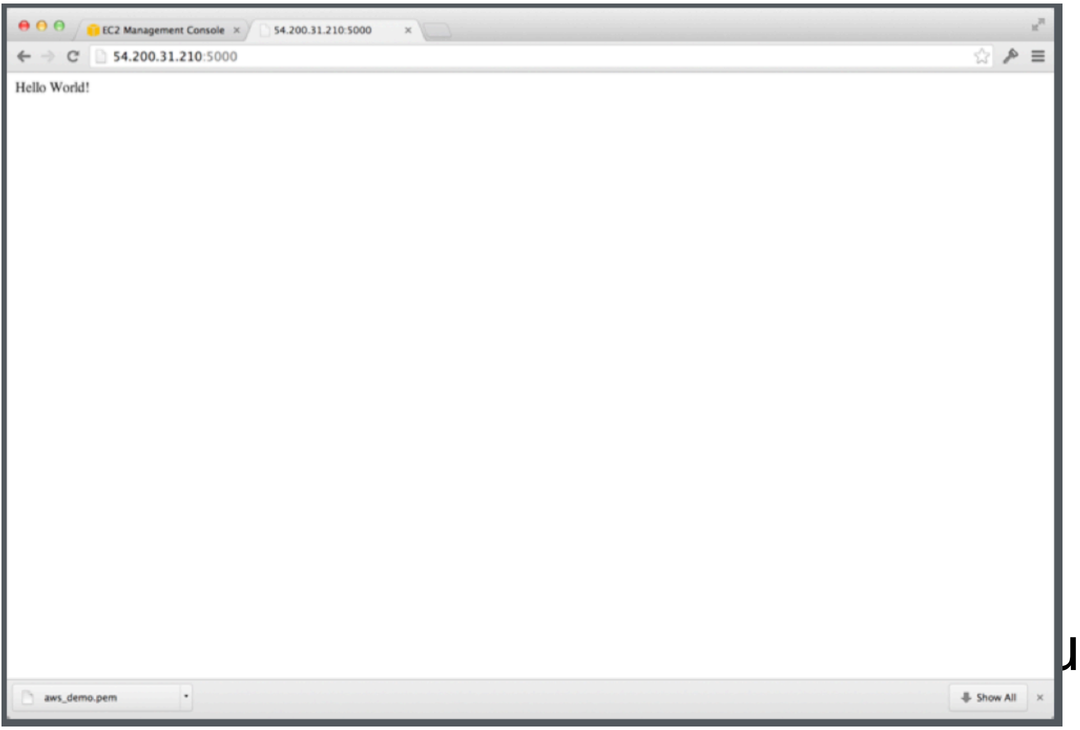
Click Add Rule and add a Custom TCP Rule -> port 5000
Also add SSH, HTTP rules as above

Now use your browser to visit your machine on port 5000. The url you should enter is: `<the IP address>:5000`



54.200.31.210:5000

Hello World!

Got it? ur table!

Congratulations!

You now have a running web server online, which anyone in the world (even your mum) can visit!
However, your deployment is not yet production ready.
Some issues:

- If you exit your terminal, the server will die. 😠
- Flask’s built-in server isn’t production-quality. If too many people visit at once, the server will crash.
- You’re on port 5000, rather than 80. 😠

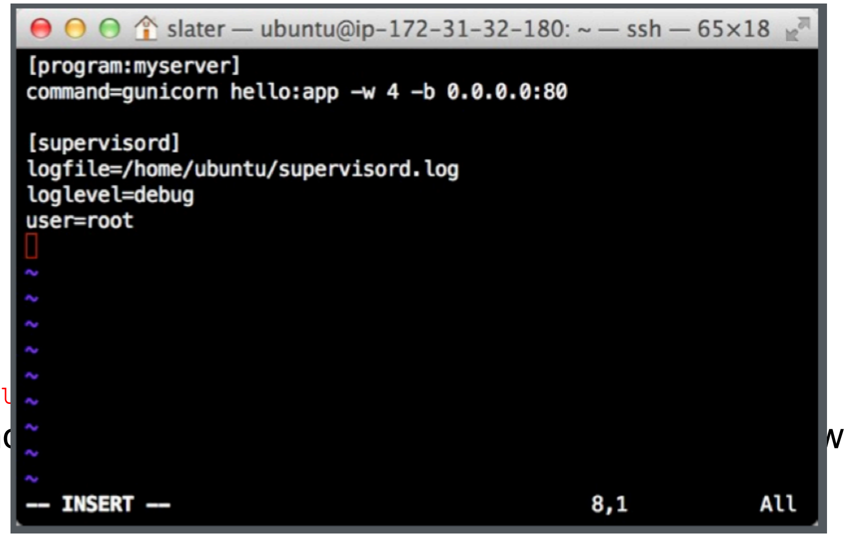
Bonus Session

The 80% solution: gunicorn + supervisor.

Note: A possible reason that gunicorn is being used here may be that normal users on linux cannot open low ports. However, on AWS you have sudo access, so just using the line in the answer:
http://serverfault.com/questions/112795/how-can-i-run-a-server-on-linux-on-port-80-as-a-normal-user

should work out just fine.

Go back to your security groups on AWS and open port 80.
The Flask webserver is kind of unstable. For a more stable, but slightly more complicated platform, use pip install (or apt-get) to get gunicorn and supervisor
- Create a file called simple.conf with the contents below:



```
[program:myserver]
command=gunicorn hello:app -w 4 -b 0.0.0.0:80

[supervisord]
logfile=/home/ubuntu/supervisord.log
loglevel=debug
user=root

~
~
~
~
~
~
~
~
~
-- INSERT --                                    8,1           All
```

- Run the command su
- Verify that you can no
wser, enter your IP address in the URL bar).

That’s it!

Congratulations on a successful deployment! When deploying your Insight project, please be aware that different settings for gunicorn and supervisor may be more appropriate for your specific situation. The documentation for both projects is very good, so you should be able to figure out what you need. In deciding whether your configuration is “good enough”, there are three important questions to ask:

- Will my project work if 20 people try to use it at the same time? (A good test is to ask other fellows to all visit your site at the same time.)
- If my server crashes, can I quickly (in less than one minute) restart it?
- If my server crashes, are my logs detailed enough for me to figure out what went wrong?