
EC2 Tutorials Documentation

Release 1.0

A. howe

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Contents

1	Full table of contents:	3
1.1	Start an Amazon Web Services computer:	3
1.2	Log into your instance with the UNIX shell	8
1.3	Log into your instance from a Mac or Linux machine	8
1.4	Log into your instance from a Windows machine	9
1.5	Configure your instance firewall	10
1.6	Running RStudio Server in the cloud	12
1.7	Transfer data to and from an EC2 instance using Filezilla	13
1.8	Creating your own Amazon Machine Image	14
1.9	Working with persistent storage: volumes and snapshots	15
1.10	Terminating your instance	22
1.11	Things to mention and discuss	24
2	Indices and tables	25

This documentation is modified from a workshop on Amazon Web Services, offered at UC Davis (and broadcast online) on March 7, 2016. [The workshop page is here.](#)

Full table of contents:

1.1 Start an Amazon Web Services computer:

This page shows you how to create a new “AWS instance”, or a running computer.

1.1.1 0. Introduction

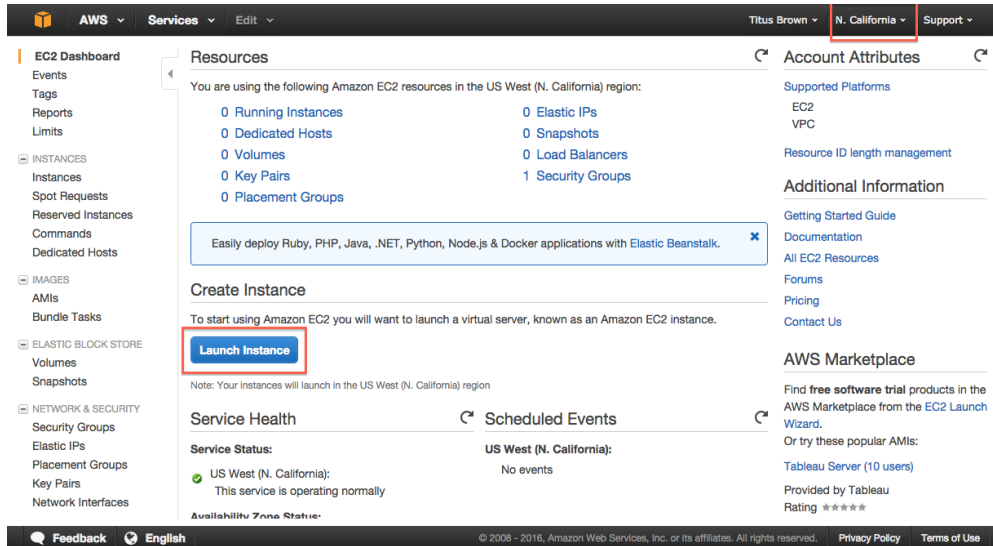
Why would you use cloud computing?:

[More resources](#)

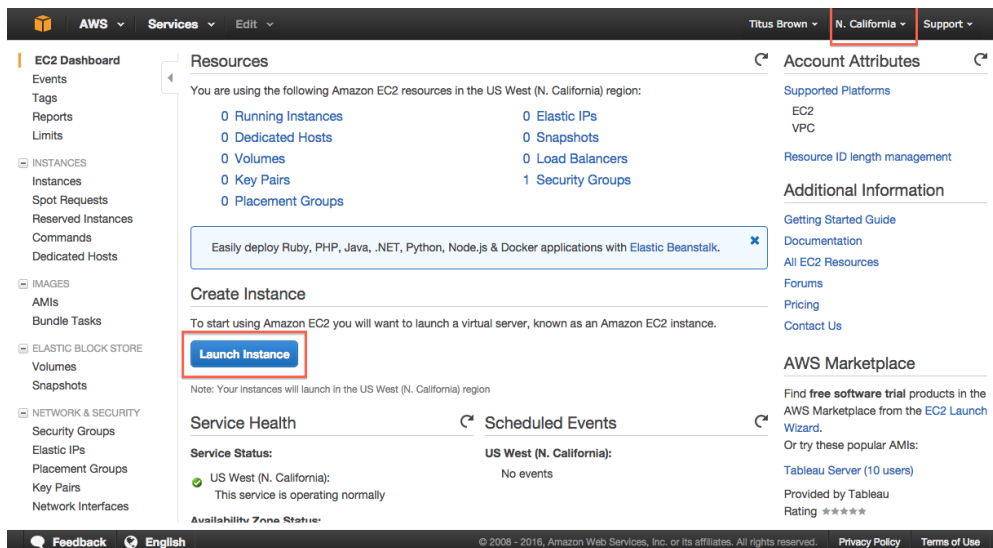
1. Your computer does not have enough resources to run the desired analysis (memory, processors, disk space, network bandwidth).
2. You want to produce results faster than your computer can.
3. You cannot install software in your computer (application does not have support for your operating system, conflicts with other existing applications)
4. You need dynamic resources – e.g., you only need a high mem machine for a week but not a whole year.
5. You don’t want to have to manage the infrastructure of an HPC or have access to an HPC.

Start at the Amazon Web Services console [EC2 launch wizard](#). You’ll need to sign in to EC2.

1.1.2 1. Switch to zone US East (N Virginia) if not already there



1.1.3 2. Click on “Launch instance.”



1.1.4 3. Select “Community AMIs.”

Step 1: Choose an Amazon Machine Image (AMI)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

Quick Start

My AMIs

AWS Marketplace

Community AMIs

☐ Free tier only ⓘ

Amazon Linux AMI 2015.09.2 (HVM), SSD Volume Type - ami-d1f482b1

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

Select

64-bit

Red Hat Enterprise Linux 7.2 (HVM), SSD Volume Type - ami-d1315fb1

Red Hat Enterprise Linux version 7.2 (HVM), EBS General Purpose (SSD) Volume Type

Root device type: ebs Virtualization type: hvm

Select

64-bit

SUSE Linux Enterprise Server 12 SP 1 (HVM), SSD Volume Type - ami-6d701b0d

SUSE Linux Enterprise Server 12 Service Pack 1 (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

Select

64-bit

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1.1.5 4. Search for ami-002f0f6a (ubuntu-wily-15.10-amd64-server)

Use ami-002f0f6a.

1.1.6 5. Click on “Select.”

1.1.7 6. Choose m4.large.

Step 2: Choose an Instance Type

	Family	Type	vCPUs ⓘ	Memory (GiB)	Instance Storage (GiB) ⓘ	EBS-Optimized Available ⓘ	Network Performance ⓘ
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	t2.micro	1	1	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	t2.large	2	8	EBS only	-	Low to Moderate
<input checked="" type="checkbox"/>	General purpose	m4.large	2	8	EBS only	Yes	Moderate
<input type="checkbox"/>	General purpose	m4.xlarge	4	16	EBS only	Yes	High
<input type="checkbox"/>	General purpose	m4.2xlarge	8	32	EBS only	Yes	High
<input type="checkbox"/>	General purpose	m4.4xlarge	16	64	EBS only	Yes	High

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

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1.1.8 7. Click “Review and Launch.”

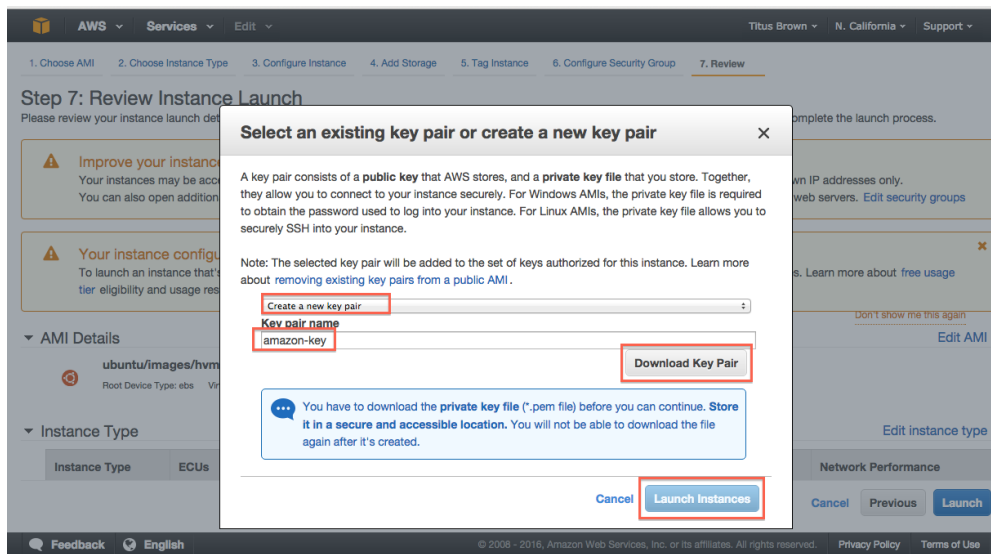
1.1.9 8. Click “Launch.”



1.1.10 9. Select “Create a new key pair.”

Note: you only need to do this the first time you create an instance. If you know where your amazon-key.pem file is, you can select ‘Use an existing key pair’ here. But you can always create a new key pair if you want, too.

If you have an existing key pair, go to step 12, “Launch instance.”



1.1.11 10. Enter name ‘amazon-key’.

1.1.12 11. Click “Download key pair.”

1.1.13 12. Click “Launch instance.”

1.1.14 13. Select View instances (lower right)

Launch Status

How to connect to your instances

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

Click **View Instances** to monitor your instances' status. Once your instances are in the **running** state, you can **connect** to them from the Instances screen. [Find out](#) how to connect to your instances.

▼ Here are some helpful resources to get you started

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

View Instances

1.1.15 14. Bask in the glory of your running instance

Note that for your instance name you can use either “Public IP” or “Public DNS”. Here, the machine only has a public IP.

Instances

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DN
	i-0b8237c8	m4.large	us-west-1b	running	Initializing	None	

Instance: i-0b8237c8 **Public IP: 54.183.148.114**

Description		Status Checks		Monitoring		Tags	
Instance ID	i-0b8237c8	Public DNS	-	Instance state	running	Public IP	54.183.148.114
Instance type	m4.large	Elastic IP	-	Private DNS	ip-172.30.1.108.us-west-1.compute.internal	Elastic IP	-
Private DNS	172.30.1.108	Availability zone	us-west-1b	Secondary private IPs	-	Security groups	launch-wizard-1 - view rules
VPC ID	vpc-287f154d	Scheduled events	No scheduled events	AMI ID	ubuntu-wily-15.10-ami64-server-		

You can now *Log into your instance with the UNIX shell* or *Configure your instance firewall*.

1.2 Log into your instance with the UNIX shell

You will need the `amazon-key.pem` file that was downloaded in step 11 of booting up your new instance (see *Start an Amazon Web Services computer*:).

Then, you can either *Log into your instance from a Mac or Linux machine* or *Log into your instance from a Windows machine*.

1.2.1 Log into your instance via the UNIX shell (Mac/Linux)

See: *Log into your instance from a Mac or Linux machine*

1.2.2 Log into your instance via MobaXTerm (Windows)

See: *Log into your instance from a Windows machine*

Logging in is the starting point for most of the follow-on tutorials. For example, you can now install and run software on your EC2 instance.

Go back to the top page to continue: *EC2 Tutorials*

1.3 Log into your instance from a Mac or Linux machine

You'll need to do two things: first, set the permissions on `amazon-key.pem`:

```
chmod og-rwx ~/Downloads/amazon-key.pem
```

Then, ssh into your new machine using your key:

```
ssh -i ~/Downloads/amazon-key.pem ubuntu@MACHINE_NAME
```

where you should replace `MACHINE_NAME` with the public IP or hostname of your EC2 instance, which is located at the top of the host information box (see screenshot below). It should be something like `54.183.148.114` or `ec2-XXX-YYY.amazonaws.com`.

Here are some screenshots!

1.3.1 Change permissions and execute ssh

```
% chmod og-rwx ~/Downloads/amazon-key.pem
% ssh -i ~/Downloads/amazon-key.pem ubuntu@54.183.148.114
The authenticity of host '54.183.148.114 (54.183.148.114)' can't be established.
RSA key fingerprint is b6:de:2f:fb:e7:12:e5:1e:5d:66:37:ef:40:bb:b7:c8.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '54.183.148.114' (RSA) to the list of known hosts.
█
```

1.3.2 Successful login

```
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '54.183.148.114' (RSA) to the list of known hosts.
Welcome to Ubuntu 15.10 (GNU/Linux 4.2.0-30-generic x86_64)

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

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-30-1-108:~$
```

Host information box - MACHINE_NAME location

The screenshot shows the AWS Management Console interface. On the left, the navigation pane includes sections like INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The main content area displays the details for a specific EC2 instance with ID 'i-0b8237c8'. A red box highlights the 'Public IP' field, which shows the value '54.183.148.114'. Other details visible include the instance type 'm4.large', availability zone 'us-west-1b', and state 'running'.

Logging in is the starting point for most of the follow-on tutorials. For example, you can now install and run software on your EC2 instance.

Go back to the top page to continue: [EC2 Tutorials](#)

1.4 Log into your instance from a Windows machine

Go follow the instructions this URL:

1.4. Log into your instance from a Windows machine

<https://angus.readthedocs.org/en/2015/amazon/log-in-with-mobaxterm-win.html>

Logging in is the starting point for most of the follow-on tutorials. For example, you can now install and run software on your EC2 instance.

Go back to the top page to continue: [EC2 Tutorials](#)

1.5 Configure your instance firewall

Normally, Amazon computers only allow shell logins via ssh (port 22 access). If we want to run a Web service or something else, we need to give the outside world access to other network locations on the computer.

Below, we will open ports 8000-9000, which will let us run things like RStudio Server. If you want to run other things, like a Web server, you'll need to find the port(s) associated with those services and open those instead of 8000-9000. (Tip: Web servers run on port 80.)

1.5.1 1. Select 'Security Groups'

Find "Security Groups" in the lower pane of your instance's information page, and click on "launch-wizard-N".

The screenshot shows the AWS Management Console interface. On the left, there is a navigation pane with categories like INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The 'INSTANCES' section is expanded, showing a list of instances. The instance 'i-0b8237c8' is selected, and its details are shown in the main pane. The instance is in the 'running' state, using the 'm4.large' instance type in the 'us-west-1b' availability zone. The public IP address is 54.183.148.114. The security groups associated with the instance are 'launch-wizard-1' and 'view rules'. The AMI ID is 'ubuntu-wily-15.10-ami64-server-'. The bottom of the console shows the footer with copyright information and links to Privacy Policy and Terms of Use.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS
	i-0b8237c8	m4.large	us-west-1b	running	Initializing	None	

Instance ID	Instance state	Instance type	Private DNS	Private IPs	Secondary private IPs	VPC ID	Public DNS	Public IP	Elastic IP	Availability zone	Security groups	Scheduled events	AMI ID
i-0b8237c8	running	m4.large	ip-172-30-1-108.us-west-1.compute.internal	172.30.1.108		vpc-287f154d	-	54.183.148.114	-	us-west-1b	launch-wizard-1, view rules	No scheduled events	ubuntu-wily-15.10-ami64-server-

1.5.2 2. Select 'Inbound'

The screenshot shows the AWS Management Console interface. On the left, the 'EC2 Dashboard' sidebar is visible with categories like INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The 'Security Groups' link is highlighted. The main content area shows a table of security groups with columns: Name, Group ID, Group Name, VPC ID, and Description. One group, 'sg-1e6d817a', is selected. Below the table, the 'Security Group: sg-1e6d817a' details are shown. The 'Inbound' tab is selected, displaying a table with columns: Group name, Group ID, Group description, and VPC ID. The 'Inbound' tab is highlighted with a red box.

1.5.3 3. Select 'Edit'

The screenshot shows the AWS Management Console interface. The 'Inbound' tab is selected for the security group 'sg-1e6d817a'. Below the 'Inbound' tab, the 'Edit' button is highlighted with a red box. The 'Edit' tab shows a table with columns: Type, Protocol, Port Range, and Source. The table contains one rule: SSH, TCP, 22, 0.0.0.0/0.

1.5.4 4. Select 'Add Rule'

The screenshot shows the 'Edit inbound rules' dialog box. The dialog has a title bar with a close button. Below the title bar, there is a table with columns: Type, Protocol, Port Range, and Source. The table contains two rules: SSH, TCP, 22, 0.0.0.0/0 and Custom TCP Rule, TCP, 8000-9000, 0.0.0.0/0. The 'Custom TCP Rule' row is highlighted with a red box. Below the table, the 'Add Rule' button is highlighted with a red box. The 'Cancel' and 'Save' buttons are also visible.

1.5.5 5. Enter rule information

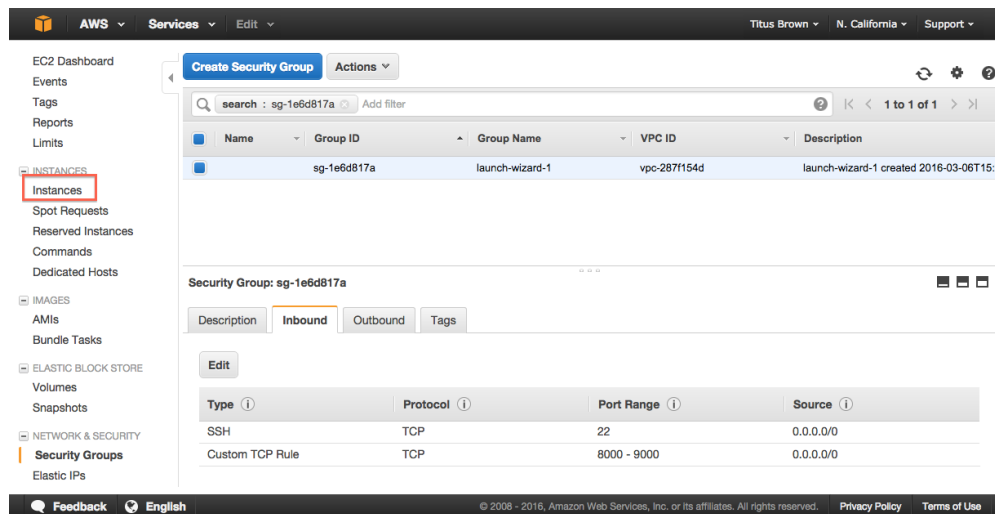
Add a new rule: Custom TCP, 8787, Source Anywhere.

Add a new rule: HTTP, 80, Source Anywhere.

Add a new rule: HTTPS, 443, Source Anywhere.

1.5.6 6. Select ‘Save’.

1.5.7 7. Return to the Instances page.



You're done!

Go back to the index: [EC2 Tutorials](#)

1.6 Running RStudio Server in the cloud

In this section, we will run RStudio Server on a remote Amazon machine. This will require starting up an instance, configuring its network firewall, and installing and running some software.

Reference documentation for running RStudio Server on Ubuntu:

<https://www.rstudio.com/products/rstudio/download-server/>

1.6.1 1. Start up an Amazon instance

Start an Ubuntu image using ami-05ed6813 on an m4.xlarge machine, as per the instructions here:

Start an Amazon Web Services computer:

1.6.2 2. Configure your network firewall

Normally, Amazon computers only allow shell logins via ssh. Since we want to run a Web service, we need to give the outside world access to other network locations on the computer.

Follow these instructions:

Configure your instance firewall

(You can do this while the computer is booting.)

You'll also want to update your DNS support and ensure that both DNS resolution and DNS hostnames are set to "yes" by following these [instructions](#).

1.6.3 3. Log in via the shell

Follow these instructions to log in via the shell:

Log into your instance with the UNIX shell.

1.6.4 4. Install R and the RStudio tool

Type the following commands

```
sudo docker pull rocker/tidyverse
sudo docker run -d -p 8787:8787 rocker/tidyverse
```

This will take a few minutes.

Upon success, you should see something a print out of alphanumerics.

1.6.5 5. Open your RStudio Server instance

Finally, go to 'http://' + your IPv4 public hostname + ':8787' in a browser, eg.

```
http://XX.XXX.XXX.XXX:8787/
```

and log into RStudio with username 'rstudio' and the password 'rstudio' you set it to above.

Voila!

You can now just go ahead and use this, or you can "stop" it, or you can freeze into an AMI for later use.

Note that on reboot, RStudio Server will start up again and all your files will be there.

Go back to the index: [EC2 Tutorials](#).

1.7 Transfer data to and from an EC2 instance using Filezilla

You will need the `amazon-key.pem` file that was downloaded in step 11 of booting up your new instance (see *Start an Amazon Web Services computer*:).

1.7.1 Download Filezilla

Download the FTP application [Filezilla](#). Note: There is an optional step in my install that asked if I wanted Yahoo to be my default browser, and I checked “NO”.

1.7.2 Open FileZilla

Near the top of the screen, you will need to provide the following information: Host, username, and port. We will also need to provide a password which is associated with your *.pem EC2 key file.

Password:

To let Filezilla know where your key file is, you can assign it through the FileZilla → Settings → SFTP → Add key file → Select your *.pem file

Host:

Your host name is the public DNS of your EC2 instance, e.g., `ec2-52-32-45-44.us-west-2.compute.amazonaws.com`

Username:

Your username is *ubuntu*

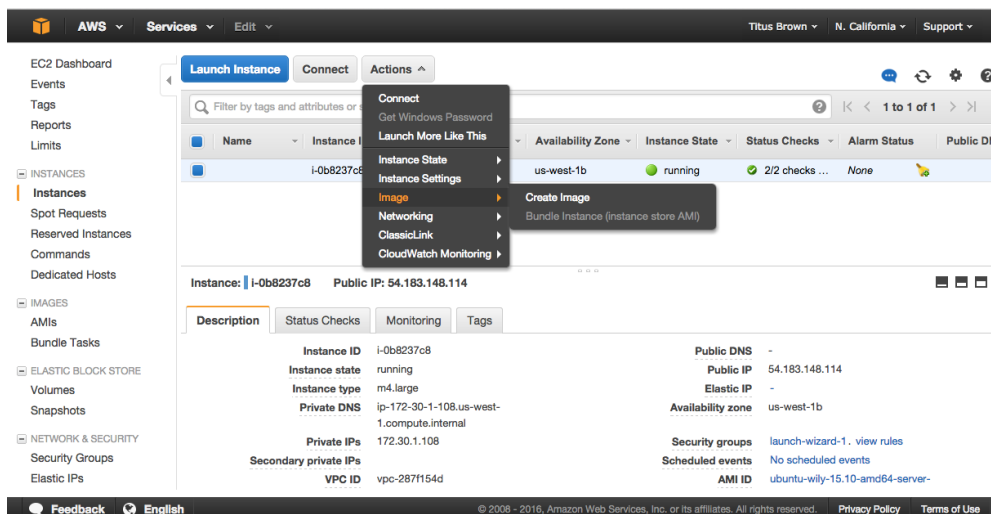
Port:

By default, the port for SFTP is 22.

Once this is filled in, you can press the *Quickconnect* button and you will see files that are in your `/home/ubuntu` directory on your server. You may now move files to and fro.

1.8 Creating your own Amazon Machine Image

1.8.1 1. Actions, Create image



The screenshot shows the AWS Management Console interface. On the left, the navigation pane lists various services like INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The main area displays the 'Actions' menu for a selected EC2 instance (i-0b8237c8). The 'Image' category is expanded, showing options like 'Create Image', 'Bundle Instance (instance store AMI)', 'Networking', 'ClassicLink', and 'CloudWatch Monitoring'. The 'Create Image' option is highlighted. Below the menu, the instance details are visible, including Instance ID, Instance state, Instance type, Private DNS, Private IPs, VPC ID, Public DNS, Public IP, Elastic IP, Availability zone, Security groups, Scheduled events, and AMI ID.

Instance ID	Instance state	Instance type	Private DNS	Private IPs	VPC ID	Public DNS	Public IP	Elastic IP	Availability zone	Security groups	Scheduled events	AMI ID
i-0b8237c8	running	m4.large	ip-172-30-1-108.us-west-1.compute.internal	172.30.1.108	vpc-287f154d	54.183.148.114	54.183.148.114	-	us-west-1b	launch-wizard-1, view rules	No scheduled events	ubuntu-wily-15.10-amd64-server-

1.8.2 2. Fill out name and description

Create Image

Instance ID ⓘ

i-0b8237c8

Image name ⓘ

titus-blast-install

Image description ⓘ

for demonstration purposes

No reboot ⓘ

☐

Instance Volumes

Volume Type ⓘ	Device ⓘ	Snapshot ⓘ	Size (GiB) ⓘ	Volume Type ⓘ	IOPS ⓘ	Delete on Termination ⓘ	Encrypted ⓘ
Root ⓘ	/dev/sda1	snap-f7961dcf	8	General Purpose SSD (GP2)	24 / 3000	<input checked="" type="checkbox"/>	Not Encrypted

Add New Volume

Total size of EBS Volumes: 8 GiB

When you create an EBS image, an EBS snapshot will also be created for each of the above volumes.

Cancel

Create Image

1.8.3 3. Wait for it to become available

AWS

Services

Edit

Titus Brown

N. California

Support

EC2 Dashboard

Events

Tags

Reports

Limits

INSTANCES

Instances

Spot Requests

Reserved Instances

Commands

Dedicated Hosts

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs

Launch

Actions

Owned by me

Filter by tags and attributes or search by keyword

Name	AMI Name	AMI ID	Source	Owner	Visibility	Status	Creation Date
	titus-blast-install	ami-24077c44	817232153141/rl...	817232153141	Private	pending	March 6, 2016 at 4:42

Image: ami-24077c44

Details

Permissions

Tags

AMI ID

ami-24077c44

AMI Name

titus-blast-install

Edit

Feedback

English

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Go back to the index: [EC2 Tutorials](#)

1.9 Working with persistent storage: volumes and snapshots

Volumes are basically UNIX disks (“block devices”) that will persist after you terminate your instance. They are tied to a zone within a region and can only be mounted on instances within that zone.

Snapshots are an Amazon-specific thing that let you communicate data on volumes between accounts. They are “read-only” backups that are created from volumes; they can be used to create new volumes in turn, and can also be shared with specific people (or made public). Snapshots are tied to a region but not a zone.

1.9.1 Creating persistent volumes to store data

0. Locate your instance zone

The screenshot shows the AWS Management Console interface for an EC2 instance. The left sidebar contains navigation links for EC2 Dashboard, Events, Tags, Reports, Limits, INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The main content area displays the instance details for instance ID i-27d61392. The instance is running in the us-west-1c availability zone. The 'Availability zone' field is highlighted with a red box.

Field	Value
Instance ID	i-27d61392
Instance state	running
Instance type	m4.large
Private DNS	ip-172-31-6-68.us-west-1.compute.internal
Private IPs	172.31.6.68
Secondary private IPs	
VPC ID	vpc-4b6ea223
Public DNS	ec2-54-215-186-13.us-west-1.compute.amazonaws.com
Public IP	54.215.186.13
Elastic IP	-
Availability zone	us-west-1c
Security groups	launch-wizard-4, view rules
Scheduled events	No scheduled events
AMI ID	ubuntu-wily-15.10-amd64-server-20160222

1. Click on the volumes tab

The screenshot shows the AWS Management Console interface for an EC2 instance. The left sidebar contains navigation links for EC2 Dashboard, Events, Tags, Reports, Limits, INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The 'Volumes' tab is selected in the left sidebar. The main content area displays the instance details for instance ID i-0b8237c8. The instance is running in the us-west-1b availability zone. The 'Volumes' tab is highlighted with a red box.

Field	Value
Instance ID	i-0b8237c8
Instance state	running
Instance type	m4.large
Private DNS	ip-172-30-1-108.us-west-1.compute.internal
Private IPs	172.30.1.108
Secondary private IPs	
VPC ID	vpc-287f154d
Public DNS	-
Public IP	54.183.148.114
Elastic IP	-
Availability zone	us-west-1b
Security groups	launch-wizard-1, view rules
Scheduled events	No scheduled events
AMI ID	ubuntu-wily-15.10-amd64-server-

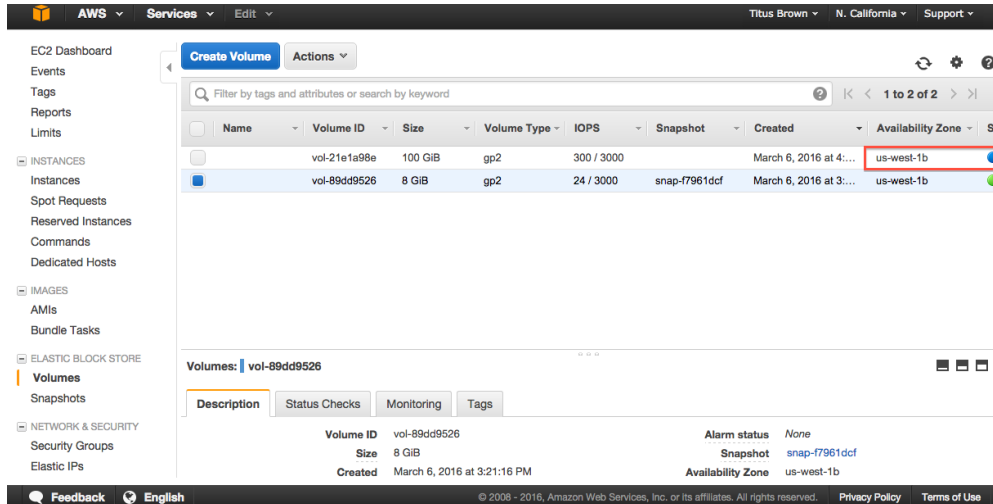
2. 'Create Volume'

The screenshot shows the AWS Management Console interface. In the left-hand navigation pane, the 'Create Volume' button is highlighted with a red box. The main content area displays the 'Volumes' page for the volume ID 'vol-2079f29d'. The page includes a table with columns: Name, Volume ID, Size, Volume Type, IOPS, Snapshot, Created, Availability Zone, State, and Alarm. The table contains one row with the following data: Name (empty), Volume ID (vol-2079f29d), Size (8 GiB), Volume Type (gp2), IOPS (24 / 3000), Snapshot (snap-f7961dcf), Created (March 7, 2016 at 7:03:33 AM UTC-8), Availability Zone (us-west-1c), State (in-use), and Alarm (None). Below the table, there are tabs for Description, Status Checks, Monitoring, and Tags. The Description tab is active, showing details for the volume ID, size, IOPS, snapshot, and availability zone.

3. Configure your volume to have the same zone as your instance

The screenshot shows the 'Create Volume' dialog box. The 'Volume Type' is set to 'General Purpose SSD (GP2)'. The 'Size (GiB)' is set to '100' (Min: 1 GiB, Max: 16384 GiB). The 'IOPS' is set to '300 / 3000' (Baseline of 3 IOPS per GiB). The 'Availability Zone' is set to 'us-west-1c'. The 'Snapshot ID' field is empty with a placeholder 'Search (case-insensitive)'. The 'Encryption' checkbox is unchecked, with the label 'Encrypt this volume'. At the bottom right, there are 'Cancel' and 'Create' buttons, with the 'Create' button highlighted by a red box.

4. Wait for your volume to be available



EC2 Dashboard

Events

Tags

Reports

Limits

INSTANCES

Instances

Spot Requests

Reserved Instances

Commands

Dedicated Hosts

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs

Create Volume

Actions

Filter by tags and attributes or search by keyword

Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone
	vol-21e1a98e	100 GiB	gp2	300 / 3000		March 6, 2016 at 4:...	us-west-1b
	vol-89dd9526	8 GiB	gp2	24 / 3000	snap-f7961dcf	March 6, 2016 at 3:...	us-west-1b

Volumes: | vol-89dd9526

Description

Status Checks

Monitoring

Tags

Volume ID

Size

Created

Alarm status

Snapshot

Availability Zone

None

snap-f7961dcf

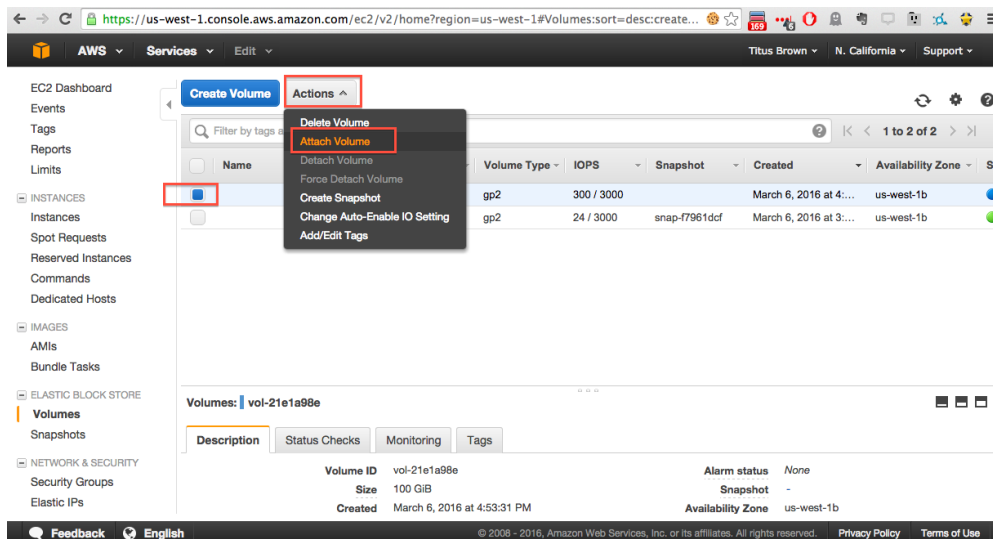
us-west-1b

Feedback

English

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5. Select volume, Actions, Attach volume



EC2 Dashboard

Events

Tags

Reports

Limits

INSTANCES

Instances

Spot Requests

Reserved Instances

Commands

Dedicated Hosts

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs

Create Volume

Actions

Filter by tags

Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone
	vol-21e1a98e	100 GiB	gp2	300 / 3000		March 6, 2016 at 4:...	us-west-1b
	vol-89dd9526	8 GiB	gp2	24 / 3000	snap-f7961dcf	March 6, 2016 at 3:...	us-west-1b

Volumes: | vol-21e1a98e

Description

Status Checks

Monitoring

Tags

Volume ID

Size

Created

Alarm status

Snapshot

Availability Zone

None

-

us-west-1b

Delete Volume

Attach Volume

Detach Volume

Force Detach Volume

Create Snapshot

Change Auto-Enable IO Setting

Add/Edit Tags

Feedback

English

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6. Select instance, attachment point, and Attach

Here, your attachment point will be '/dev/sdf' and your block device will be named '/dev/xvdf'.

Attach Volume

Volume ⓘ

vol-21e1a98e in us-west-1b

Instance ⓘ

in us-west-1b

Device ⓘ

Linux Devices: /dev/sdf through /dev/sdp

Note: Newer Linux kernels may rename your devices to /dev/xvdf through /dev/xvdp internally, even when the device name entered here (and shown in the details) is /dev/sdf through /dev/sdp.

Cancel

Attach

7. On your instance, list block devices

Type:

```
lsblk
```

You should see something like this:

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
xvda	802:0	0	8G	0	disk	
└─xvda1	802:1	0	8G	0	part	/
xvdf	802:80	0	100G	0	disk	

Now format the disk (ONLY ON EMPTY DISKS - THIS WILL ERASE ANY DATA ON THE DISK):

```
sudo mkfs -t ext4 /dev/xvdf
```

and mount the disk:

```
sudo mkdir /disk
sudo mount /dev/xvdf /disk
sudo chmod a+rwxt /disk
```

and voila, anything you put on /disk will be on the volume that you allocated!

The command ‘df -h’ will show you what disks are actually mounted & where.

Detaching volumes

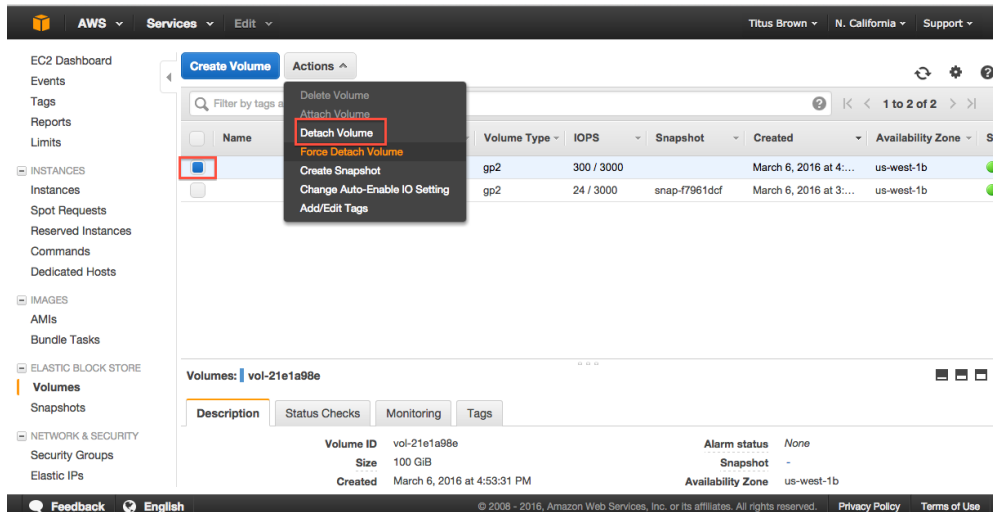
1. Unmount it from the instance

Change out of the directory, stop any running programs using it, and then:

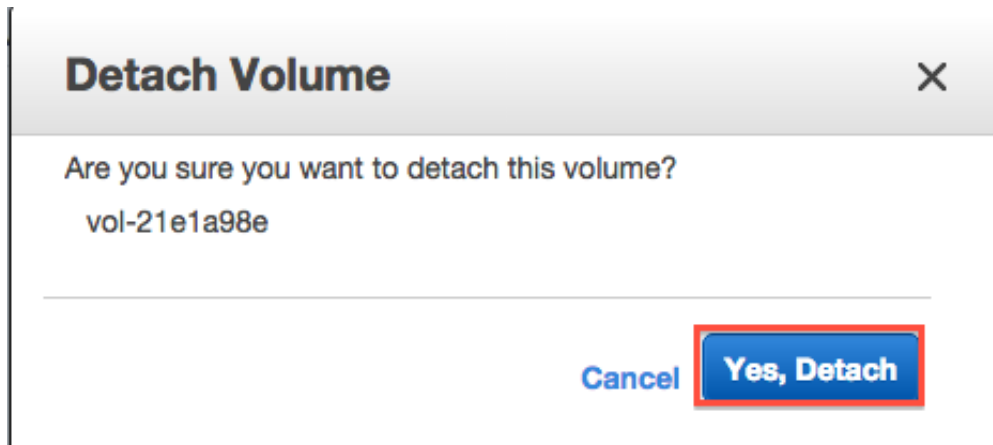
```
sudo umount /disk
```

2. Detach

On the ‘volumes’ tab in your EC2 console, go to Actions, Detach.



3. Yes, detach.



Note, volumes remain attached when you reboot or stop an instance, but are (of course) detached when you terminate an instance.

1.9.2 Creating snapshots of volumes

1. Actions, Create snapshot

The screenshot shows the AWS Management Console interface. On the left, the navigation pane is visible with categories like INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The 'Volumes' link under 'ELASTIC BLOCK STORE' is selected. The main content area shows a table of volumes. A context menu is open over the first volume, 'vol-21e1a98e', with the 'Create Snapshot' option highlighted. Below the table, the details for the selected volume are shown.

Volume Type	IOPS	Snapshot	Created	Availability Zone
gp2	300 / 3000		March 6, 2016 at 4:...	us-west-1b
gp2	24 / 3000	snap-f7961dcf	March 6, 2016 at 3:...	us-west-1b

Volumes: vol-21e1a98e

Volume ID	Size	Created	Alarm status	Snapshot	Availability Zone
vol-21e1a98e	100 GiB	March 6, 2016 at 4:53:31 PM	None	-	us-west-1b

2. Fill out name and description

The 'Create Snapshot' dialog box is shown. It contains fields for 'Volume', 'Name', 'Description', and 'Encrypted'. The 'Volume' field is pre-filled with 'vol-21e1a98e'. The 'Name' field contains 'titus test snapshot'. The 'Description' field contains 'for demonstration purposes'. The 'Encrypted' field is set to 'No'. At the bottom right, there are 'Cancel' and 'Create' buttons.

Create Snapshot

Volume *i* vol-21e1a98e

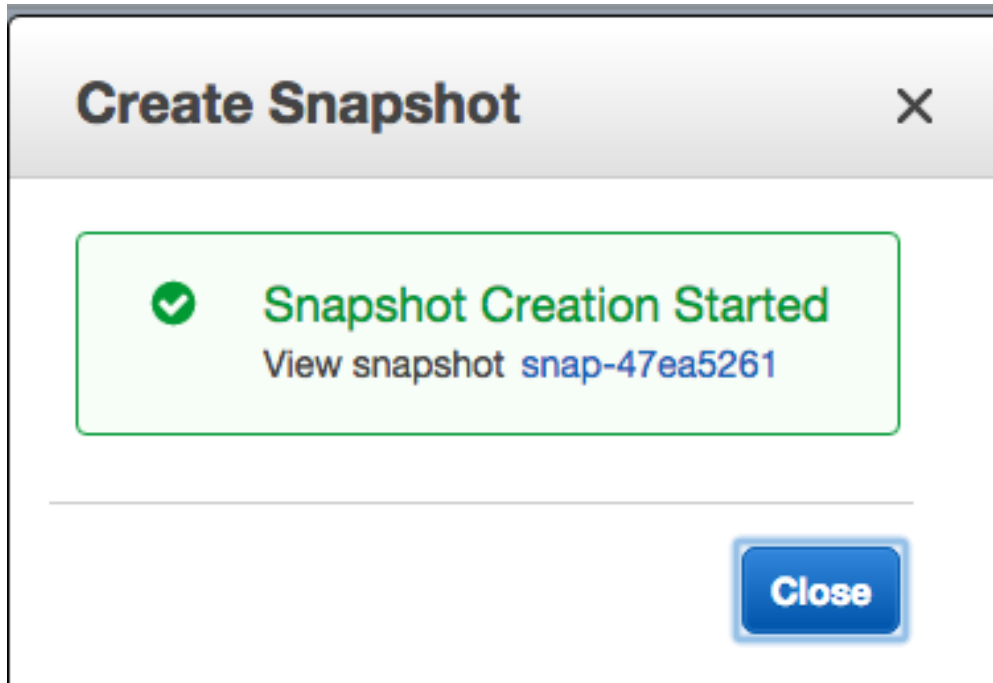
Name *i* titus test snapshot

Description *i* for demonstration purposes

Encrypted *i* No

Cancel Create

3. Click 'Close' & wait.



1.10 Terminating your instance

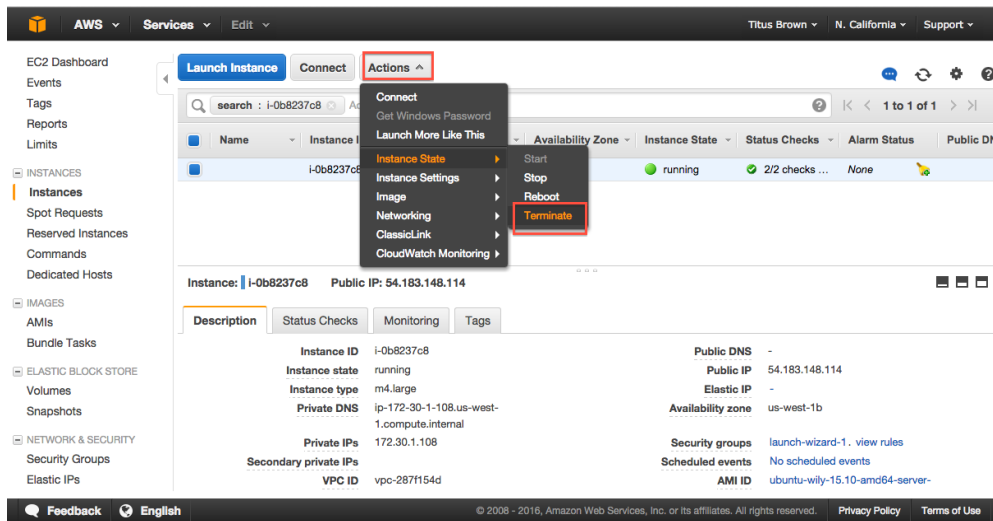
Amazon will happily charge you for running instances and/or associated ephemeral storage until the cows come home - it's your responsibility to turn things off. The Right Way to do this for running instances is to terminate.

The caveat here is that *everything ephemeral* will be deleted (excluding volumes that you created/attached). So you want to make sure you transfer off anything you care about.

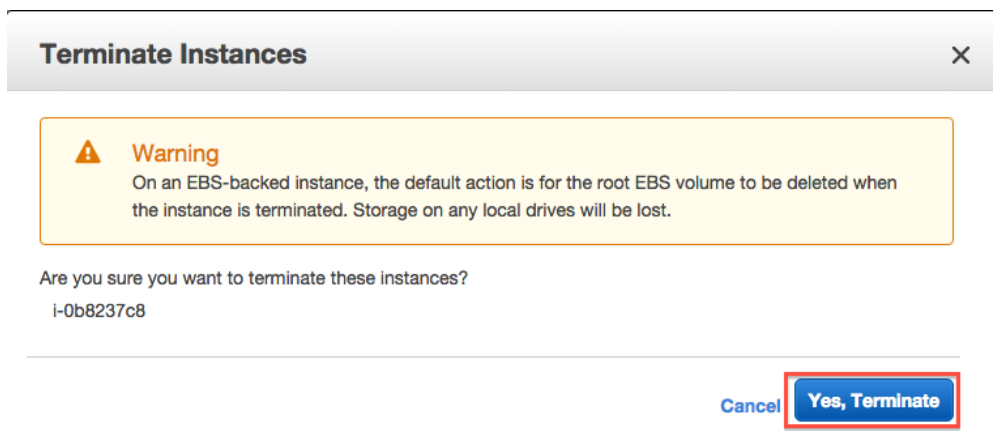
To terminate:

1.10.1 1. Select Actions, Instance State, Terminate

In the 'Instances' tab, select your instance and then go to the Actions menu.

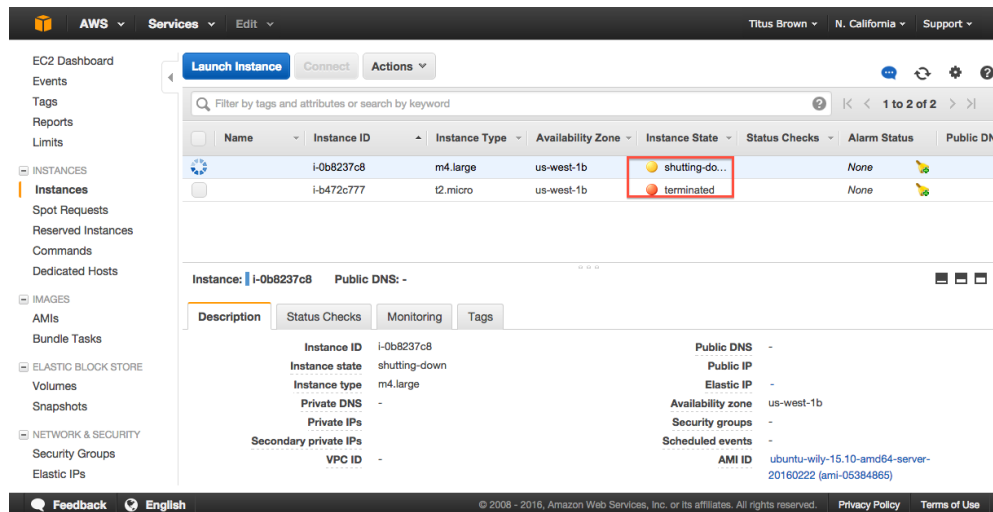


1.10.2 2. Agree to terminate.



1.10.3 3. Verify status on your instance page.

Instance state should be either “shutting down” or “terminated”.



Return to index: [EC2 Tutorials](#)

1.11 Things to mention and discuss

1.11.1 When do disks go away?

- never on reboot;
- ephemeral disks go away on stop;
- AMI-attached volumes go away on terminate;
- attached volumes never go away on terminate and have to be explicitly deleted;
- snapshots only go away when you explicitly delete them.

1.11.2 What are you charged for?

- you are charged for a running instance at the @@instance price rates;
- ephemeral storage/instance-specific storage is included within that.
- when you stop an instance, you are charged at disk-space rates for the stopped disk;
- when you create a volume, you are charged for that volume until you delete it;
- when you create a snapshot, you are charged for that snapshot until you delete it.

To make sure you're not getting charged, go to your Instance view and clear all search filters; anything that is "running" or "stopped" is costing you. Also check your volumes and your snapshots - they should be empty.

1.11.3 Regions vs zones:

- AMIs and Snapshots (and keys and security groups) are per region;
- Volumes and instances are per zone;

CHAPTER 2

Indices and tables

- `genindex`
- `modindex`
- `search`