

Web 3

Last year we dubbed it:



Web 3000

Let's do some damage.

This year let's do it one better.



Web 3001

Now with 100% more damage.
(smells better, too!)

Today we conquer some fears.

You're building your own server from scratch.
No GoDaddy allowed.



Amazon Web Services

AWS vocab!

- EC2 = Elastic Cloud Computing. Basically a computer in the cloud.
- S3 = Simple Storage Service. Basically a hard drive in the cloud.
- Route 53 = DNS Management.
- Everything Else = We'll deal with on a case by case basis.

Step 1

Sign up for Amazon and log into the portal.

<http://aws.amazon.com>

AWS Registration & Costs

- You can use your existing Amazon account, but it requires some level of authentication the first time you do it. Takes ~5 minutes to verify and typically requires a cell phone code.
- You can check your billing and usage at <http://aws.amazon.com/account/>
- Free tier for a year. What we cover in this deck shouldn't cost more than \$10/month.

Amazon Web Services

Compute & Networking

[Direct Connect](#)

Dedicated Network Connection to AWS

EC2

Virtual Servers in the Cloud

Elastic MapReduce

Managed Hadoop Framework

Route 53

Scalable Domain Name System

VPC

Isolated Cloud Resources

Storage & Content Delivery

CloudFront

Global Content Delivery Network

Glacier

Archive Storage in the Cloud

S3

Scalable Storage in the Cloud

Storage Gateway

Integrates On-Premises IT Environments with Cloud Storage

Database

 DynamoDB

Predictable and Scalable NoSQL Data Store

 ElastiCache

In-Memory Cache

 RDS

Managed Relational Database Service

 RedshiftNEW
Managed Petabyte-Scale Data Warehouse Service

Deployment & Management

 CloudFormation

Templated AWS Resource Creation

 CloudWatch

Resource and Application Monitoring

 Data Pipeline

Orchestration for Data-Driven Workflows

 Elastic Beanstalk

AWS Application Container

 IAM

Secure AWS Access Control

 OpsWorksNEW
DevOps Application Management Service

App Services

 CloudSearch

Managed Search Service

 Elastic Transcoder

NEW

Easy-to-use Scalable Media Transcoding

 SES

Email Sending Service

 SNS

Push Notification Service

 SQS

Message Queue Service

 SWF

Workflow Service for Coordinating Application Components

Click EC2.

Additional Resources

Getting Started

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

Trusted Advisor

Best practice recommendations to save money, improve fault tolerance, increase performance, and close security gaps.

Service Health

 All services operating normally.

Updated: Sep 07 2013 19:19:00 GMT-0400

Service Health Dashboard

Set Start Page

Console Home ▾

 AWS Marketplace

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



EC2 Dashboard

Events

Tags

- INSTANCES

Instances

Spot Requests

Reserved Instances

- IMAGES

AMIs

Bundle Tasks

- ELASTIC BLOCK STORE

Volumes

Snapshots

- NETWORK & SECURITY

Security Groups

Elastic IPs

Placement Groups

Load Balancers

Key Pairs

Network Interfaces

Resources

You are using the following Amazon EC2 resources in the US East (N. Virginia) region:

0 Running Instances

2 Volumes

6 Key Pairs

0 Placement Groups

1 Elastic IP

0 Snapshots

0 Load Balancers

5 Security Groups

Optimize your resources' cost, performance and security with [AWS Trusted Advisor](#)

Account Attributes

Supported Platforms

EC2-Classic

EC2-VPC

Additional Information

[Getting Started Guide](#)[Documentation](#)[All EC2 Resources](#)[Forums](#)[Pricing](#)[Contact Us](#)

Popular AMIs on AWS

[Marketplace](#)[Debian GNU/Linux](#)

Provided by Debian

Rating ★★★★☆

Free Software, pay only for AWS usage

[View all Operating Systems](#)[Couchbase Server - Community Edition](#)

Provided by Couchbase

Rating ★★★★☆

Free Software, pay only for AWS usage

[View all Databases](#)[LAMP Stack powered by BitNami](#)

Provided by BitNami

Rating ★★★★★

That shiny “Launch Instance” button looks exciting... but don't click it yet.

Service Health

Service Status:

- US East (N. Virginia):
This service is operating normally

Availability Zone Status:

- us-east-1a:
Availability zone is operating normally
- us-east-1b:
Availability zone is operating normally
- us-east-1c:
Availability zone is operating normally

Scheduled Events

US East (N. Virginia):

No events



EC2 Dashboard

Events

Tags

INSTANCES

Instances

Spot Requests

Reserved Instances

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs

Placement Groups

Load Balancers

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Free Software, pay only for AWS usage

[View all Databases](#)[LAMP Stack powered by BitNami](#)

Provided by BitNami

Rating ★★★★★

First Click "Security Groups"

Note: Your instances will launch in the US East (N. Virginia) region

Service Health

Service Status:

 US East (N. Virginia):
This service is operating normally

Availability Zone Status:

-  us-east-1a:
Availability zone is operating normally
-  us-east-1b:
Availability zone is operating normally
-  us-east-1c:
Availability zone is operating normally

Scheduled Events

US East (N. Virginia):

No events

(wait, wtf is a security group)

Security Groups are like a user profile but for AMI ports.

(wait, wtf is an AMI port)

More vocab!

- **AMI** = Amazon Machine Image. Sort of like a Nintendo ROM, but of a computer.
- **Port** = More specifically a computer networking port. A port can let software communicate with other software.

Laymen's terms: A channel on a walkie talkie. Your computer has ~65,535 available ports. Many are already being used for things like Dropbox and Evernote, but also things like DNS, printer serving, and other assorted scary automatic computer things.

Ports and the Web.

- 80 = Typically used for HTTP. (Everyone remember what that is?)
- 22 = SSH. also known as SFTP.
- 143 = IMAP, also known as how you likely get your email.
- 25 = SMTP, also known as you you likely send your email.
- and so on.

There is no special significance to these numbers.
People just decided these things and now they're standards. And there you have it.

EC2 Dashboard

Events

Tags

INSTANCES

Instances

Spot Requests

Reserved Instances

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs

Placement Groups

Load Balancers

Key Pairs

Network Interfaces

Create Security Group

Delete

Viewing:

EC2 Security Groups

Search

1 to 2 of 2 Items

	Group ID	Name	VPC ID	Description
<input type="checkbox"/>	sg-00c81368	Custom		Custom rules for this box
<input type="checkbox"/>	sg-08c91260	default		default group

0 Security Groups selected

Select a security group above

Click “Create Security Group”

EC2 Dashboard

Events

Tags

INSTANCES

Instances

Spot Requests

Reserved Instances

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs

Placement Groups

Load Balancers

Key Pairs

Network Interfaces

Create Security Group**Delete**

Viewing: EC2 Security Groups

Search

1 to 2 of 2 Items

	Group ID	Name	VPC ID	Description
<input type="checkbox"/>	sg-00c81368	Custom		Custom rules for this box
<input type="checkbox"/>	sg-08c91260	default		default group

Create Security Group

0 Security Groups selected

Select a security group above

Name:

Description:

VPC:

Name it “The Basics”.
Give it a ludicrous description.
Press “Yes Create”.



EC2 Dashboard
Events
Tags

INSTANCES
Instances
Spot Requests
Reserved Instances

IMAGES
AMIs
Bundle Tasks

ELASTIC BLOCK STORE
Volumes
Snapshots

NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
Network Interfaces

Create Security Group Delete
Viewing: EC2 Security Groups ▾ Search

	Group ID	Name	VPC ID	Description
<input type="checkbox"/>	sg-00c81368	Custom		Custom rules for this box
<input type="checkbox"/>	sg-08e91200	default		default group
<input checked="" type="checkbox"/>	sg-af27b1c4	The Basics		HTTP, SFTP, etc.

1 Security Group selected

Security Group: The Basics

Details Inbound

Create a new rule. Custom TCP rule

Port range: (e.g., 80 or 49152-65535)
Source: 0.0.0.0/0 (e.g., 192.168.2.0/24, sg-47ad482e, or 1234567890/default)

+ Add Rule

TCP Port (Service)	Source	Action
22 (SSH)	0.0.0.0/0	Delete
80 (HTTP)	0.0.0.0/0	Delete
110 (POP3)	0.0.0.0/0	Delete
143 (IMAP)	0.0.0.0/0	Delete
3306 (MYSQL)	0.0.0.0/0	Delete
30000	0.0.0.0/0	Delete

Select your new Security Group.
Then click the “Inbound” Tab.



EC2 Dashboard

Events

Tags

INSTANCES

Instances

Spot Requests

Reserved Instances

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs

Placement Groups

Load Balancers

Key Pairs

Network Interfaces

Create Security Group

Delete

Viewing:

EC2 Security Groups

Search

	Group ID	Name	VPC ID	Description
<input type="checkbox"/>	sg-00c81368	Custom		Custom rules for this box
<input type="checkbox"/>	sg-08c91260	default		default group
<input checked="" type="checkbox"/>	sg-af27b1c4	The Basics		HTTP, SFTP, etc.

Select HTTP from the menu.

Click “Add Rule”.

1 Security Group selected

Security Group: The Basics

Details Inbound

Create a new rule: Custom TCP rule

Port range: Port (Service) Source Action

TCP	Port (Service)	Source	Action
22 (SSH)		0.0.0.0/0	Delete
80 (HTTP)		0.0.0.0/0	Delete
110 (POP3)		0.0.0.0/0	Delete
143 (IMAP)		0.0.0.0/0	Delete
3306 (MYSQL)		0.0.0.0/0	Delete
30000		0.0.0.0/0	Delete

Port range: (e.g., 80 or 49152-65535)

Source: 0.0.0.0/0 (e.g., 192.168.2.0/24, sg-47ad482e, or 1234567890/default)

Add Rule

Apply Rule Changes



EC2 Dashboard
Events
Tags

INSTANCES
Instances
Spot Requests
Reserved Instances

IMAGES
AMIs
Bundle Tasks

ELASTIC BLOCK STORE
Volumes
Snapshots

NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
Network Interfaces

Create Security Group

Delete

Viewing: EC2 Security Groups

Search

Back Forward 1 to 3 of 3 Items

	Group ID	Name	VPC ID	Description
<input type="checkbox"/>	sg-00c81368	Custom		Custom rules for this box
<input type="checkbox"/>	sg-08c91260	default		default group
<input checked="" type="checkbox"/>	sg-af27b1c4	The Basics		HTTP, SFTP, etc.

Repeat for SSH, MySQL, POP3, IMAP.

1 Security Group selected

Security Group: The Basics

Details Inbound

Create a new rule: Custom TCP rule

Port range: Port range: (e.g., 80 or 49152-65535)

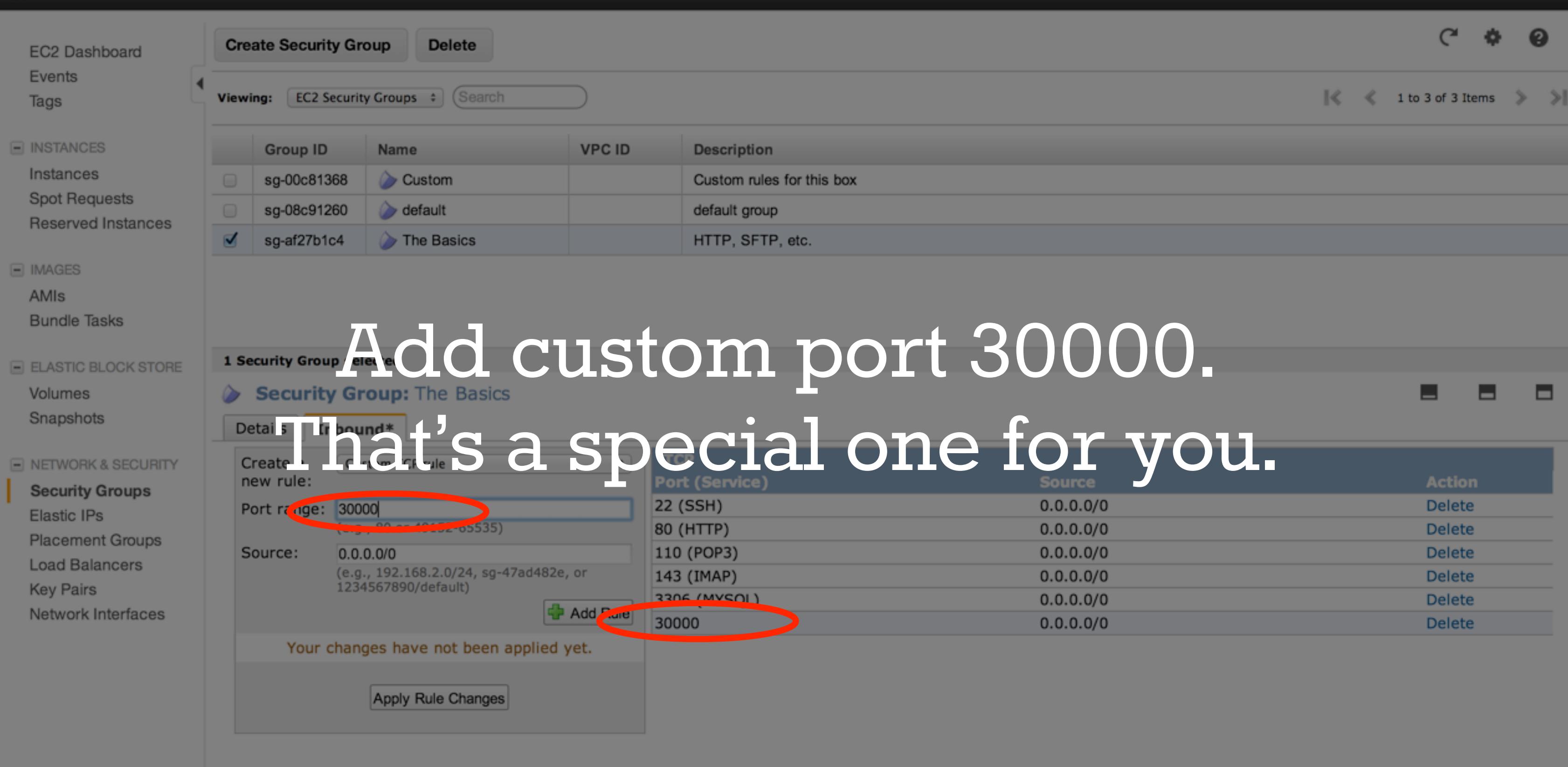
Source: Source: 0.0.0.0/0 (e.g., 192.168.2.0/24, sg-47ad482e, or 1234567890/default)

TCP

Port (Service)	Source	Action
22 (SSH)	0.0.0.0/0	Delete
80 (HTTP)	0.0.0.0/0	Delete
110 (POP3)	0.0.0.0/0	Delete
143 (IMAP)	0.0.0.0/0	Delete
3306 (MYSQL)	0.0.0.0/0	Delete
20000	0.0.0.0/0	Delete

Add Rule

Apply Rule Changes



Services ▾ Edit ▾ Jamie Kosoy ▾ N. Virginia ▾ Help ▾

EC2 Dashboard Events Tags

Create Security Group Delete

Viewing: EC2 Security Groups Search

1 to 3 of 3 Items

	Group ID	Name	VPC ID	Description
<input type="checkbox"/>	sg-00c81368	Custom		Custom rules for this box
<input type="checkbox"/>	sg-08c91260	default		default group
<input checked="" type="checkbox"/>	sg-af27b1c4	The Basics		HTTP, SFTP, etc.

Instances Spot Requests Reserved Instances

AMIs Bundle Tasks

ELASTIC BLOCK STORE Volumes Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs Placement Groups Load Balancers Key Pairs Network Interfaces

Click Apply Rule Changes.

1 Security Group selected

Security Group: The Basics

Details Inbound*

Create a new rule: Custom TCP rule

Port range: 30000 (e.g., 80 or 49152-65535)

Source: 0.0.0.0/0 (e.g., 192.168.2.0/24, sg-47ad482e, or 1234567890/default)

+ Add Rule

Your changes have not been applied yet.

Apply Rule Changes

TCP Port (Service)	Source	Action
22 (SSH)	0.0.0.0/0	Delete
80 (HTTP)	0.0.0.0/0	Delete
110 (POP3)	0.0.0.0/0	Delete
143 (IMAP)	0.0.0.0/0	Delete
3306 (MySQL)	0.0.0.0/0	Delete
30000	0.0.0.0/0	Delete

You'll probably never
have to do that part again.

Now that we have a Security Profile
we're ready to actually use it!



EC2 Dashboard

Events

Tags

INSTANCES

Instances

Spot Requests

Reserved Instances

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs

Placement Groups

Load Balancers

Key Pairs

Network Interfaces

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Provided by Debian

Rating ★★★★☆

Free Software, pay only for AWS usage

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Rating ★★★★☆

Free Software, pay only for AWS usage

[View all Databases](#)[LAMP Stack powered by BitNami](#)

Provided by BitNami

Rating ★★★★★

Back to the EC2 Dashboard!

Launch Instance!

Launch Instance

Service Health

Service Status:

US East (N. Virginia):
This service is operating normally

Availability Zone Status:

us-east-1a:
Availability zone is operating normally

us-east-1b:
Availability zone is operating normally

us-east-1c:
Availability zone is operating normally

Scheduled Events

US East (N. Virginia):

No events



EC2 Dashboard

Events

Tags

INSTANCES

Instances

Spot Requests

Reserved Instances

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs

Placement Groups

Load Balancers

Key Pairs

Network Interfaces

Create a New Instance

Cancel X

Select an option below:

 Classic Wizard

Launch an On-Demand or Spot instance using the classic wizard with fine-grained control over how it is launched.

 Quick Launch Wizard

Launch an On-Demand instance using an editable, default configuration so that you can get started in the cloud as quickly as possible.

 AWS Marketplace

AWS Marketplace is an online store where you can find and buy software that runs on AWS. Launch with 1-Click and pay by the hour.

[Submit Feedback](#) [Getting Started Guide](#)**Name Your Instance:** Pick a meaningful name, e.g. Web Server

The Banana Stand

Choose a Key Pair:

Public/private key pairs allow you to securely connect to your instance after it launches.

 Select Existing Create New NoneName: Download

Please note that you need to download the key pair before you can continue.

Choose a Launch Configuration:

[More Amazon Machine Images NEW!](#)

Search through public and AWS Marketplace AMIs or choose from your own custom AMIs.

 **Amazon Linux AMI 2013.03**
The Amazon Linux AMI is an EBS-backed PV-GPUD instance. It includes 64 bit 32 bit Free tier eligible
Linux 3.4, AWS tools, and repository access to multiple versions of MySQL, PostgreSQL, Python, Ruby, and Tomcat.

 **Red Hat Enterprise Linux 6.4**
Red Hat Enterprise Linux version 6.4, EBS-boot.

64 bit 32 bit
Free tier eligible

 **SUSE Linux Enterprise Server 11**
SUSE Linux Enterprise Server 11 Service Pack 3 basic install, EBS boot 64 bit 32 bit
with Amazon EC2 AMI Tools preinstalled; Apache 2.2, MySQL 5.5, PHP 5.3, and Ruby 1.8.7 available

 **Ubuntu Server 12.04.2 LTS**
Ubuntu Server 12.04.2 LTS with support available from Canonical (<http://www.ubuntu.com/cloud/services>).
64 bit 32 bit
Free tier eligible

 **Ubuntu Server 13.04**
Ubuntu Server 13.04 with support available from Canonical
64 bit 32 bit

Note: You can customize your settings in the next step.

Continue ▶



EC2 Dashboard

Events

Tags

INSTANCES

Instances

Spot Requests

Reserved Instances

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs

Placement Groups

Load Balancers

Key Pairs

Network Interfaces

Create a New Instance

Cancel X

Select an option below:

 Classic Wizard

Launch an On-Demand or Spot instance using the classic wizard with fine-grained control over how it is launched.

 Quick Launch Wizard

Launch an On-Demand instance using the pre-defined default configuration so you can get started in the cloud as quickly as possible.

 AWS Marketplace

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[Submit Feedback](#) [Getting Started Guide](#)**Name Your Instance:** Pick a meaningful name, e.g. Web Server**Choose a Key Pair:**

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 Select Existing Create New NoneName: [Download](#)

Please note that you need to download the key pair before you can continue.

Choose a Launch Configuration:

More Amazon Machine Images NEW		
Search through public and AWS Marketplace AMIs or choose from your own custom AMIs.		
 Amazon Linux AMI 2013.03.1	The Amazon Linux AMI is an EBS-backed, PV-GRUB image. It includes Linux 3.4, AWS tools, and repository access to multiple versions of MySQL, PostgreSQL, Ruby, and more.	<input type="radio"/> 64 bit <input checked="" type="radio"/> 32 bit
 Red Hat Enterprise Linux version 6.4, EBS-boot.	Red Hat Enterprise Linux version 6.4, EBS-boot.	<input type="radio"/> 64 bit <input checked="" type="radio"/> 32 bit  Free tier eligible
 SUSE Linux Enterprise Server 11	SUSE Linux Enterprise Server 11 Service Pack 3 basic install, EBS boot with Amazon EC2 AMI Tools preinstalled; Apache 2.2, MySQL 5.5, PHP 5.3, and Ruby 1.8.7 available.	<input type="radio"/> 64 bit <input checked="" type="radio"/> 32 bit
 Ubuntu Server 12.04.2 LTS	Ubuntu Server 12.04.2 LTS with support available from Canonical (http://www.ubuntu.com/cloud/services).	<input type="radio"/> 64 bit <input checked="" type="radio"/> 32 bit  Free tier eligible
 Ubuntu Server 13.04	Ubuntu Server 13.04 with support available from Canonical.	<input type="radio"/> 64 bit <input checked="" type="radio"/> 32 bit

Note: You can customize your settings in the next step.

[Continue](#)

Select “Create New” for Key Pair. *or use an existing one if you already have one.



EC2 Dashboard

Events

Tags

INSTANCES

Instances

Spot Requests

Reserved Instances

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs

Placement Groups

Load Balancers

Key Pairs

Network Interfaces

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Name Your Instance:

Pick a meaningful name, e.g. Web Server

Choose a Key Pair:

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Download

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More Amazon Machine Images NEW!

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Amazon Linux 2013.03.1 The Amazon Linux AMI is a Linux-based, PV-SGRUB image. It includes 64-bit and 32-bit Linux 3.4, AWS tools, and repository access to multiple versions of MySQL, PostgreSQL, Python, Ruby, and Tomcat. **Free tier eligible**

Red Hat Enterprise Linux 6.4 Red Hat Enterprise Linux version 6.4, EBS-boot. **Free tier eligible**

SUSE Linux Enterprise Server 11 SUSE Linux Enterprise Server 11 Service Pack 3 basic install, EBS boot **64 bit** **32 bit** **Free tier eligible** with Amazon EC2 AMI Tools preinstalled; Apache 2.2, MySQL 5.5, PHP 5.3, and Ruby 1.8.7 available

Ubuntu Server 12.04.2 LTS Ubuntu Server 12.04.2 LTS with support available from Canonical (<http://www.ubuntu.com/cloud/services>). **64 bit** **32 bit** **Free tier eligible**

Ubuntu Server 13.04 Ubuntu Server 13.04 with support available from Canonical **64 bit** **32 bit**

Note: You can customize your settings in the next step.

Continue ▶

Download that Key Pair!
You'll get some wacky PEM file.
We'll deal with that later.

[Submit Feedback](#) [Getting Started Guide](#)



EC2 Dashboard

Events

Tags

INSTANCES

Instances

Spot Requests

Reserved Instances

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

NETWORK & SECURITY

Security Groups

Elastic IPs

Placement Groups

Load Balancers

Key Pairs

Network Interfaces

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 AWS Marketplace

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Select Ubuntu Server 12.04.2 LTS. Press “Continue”.

Name Your Instance: Pick a meaningful name, e.g. Web Server

Choose a Key Pair:

Public/private key pairs allow you to securely connect to your instance after it launches.

Select Existing Create New None

Name: Download

Please note that you need to download the key pair before you can continue.

Choose a Launch Configuration:

More Amazon Machine Images More Search through public and AWS Marketplace AMIs or choose from your own custom AMIs.

Amazon Linux AMI 2013.03.1

The Amazon Linux AMI is an EBS-backed, PV-GRUB image. It includes Linux 2.6, AWS tools, and repository access to multiple versions of MySQL, PostgreSQL, Tomcat, and TomEE.

64 bit 32 bit

★ Free tier eligible

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Red Hat Enterprise Linux version 6.4, EBS-boot.

64 bit 32 bit

★ Free tier eligible

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64 bit 32 bit

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64 bit 32 bit

★ Free tier eligible

Ubuntu Server 13.04

Ubuntu Server 13.04 with support available from Canonical (<http://www.ubuntu.com/cloud/services>).

64 bit 32 bit

★ Free tier eligible

Note: You can customize your settings in the next step.

Continue ➔

Submit Feedback Getting Started Guide

Okay, whoa. What's an Ubuntu?

Ubuntu is a variation of Linux.
Also known as a “flavor”.

There are many flavors of Linux.

Just like there are many flavors of ice cream.

Other flavors

- Fedora
- SUSE
- Red Hat
- CentOS
- Probably tons of others.

OSX is a sort of flavor of Linux.

Mac users, you've been deceived!

Ubuntu is one I am comfortable with.

They're all more or less the same.

I picked it because I think Ubuntu is a fun word to say.

Everybody happy? Wonderful!

EC2 Dashboard
Events
Tags

INSTANCES
Instances
Spot Requests
Reserved Instances

IMAGES
AMIs
Bundle Tasks

ELASTIC BLOCK STORE
Volumes
Snapshots

NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
Network Interfaces

Create a New Instance

Amazon Linux AMI 2013.03.1 (ami-05355a6c)

Platform: Amazon Linux Architecture: x86_64

The Amazon Linux AMI is an EBS-backed, PV-GRUB image. It includes Linux 3.4, AWS tools, and repository access to multiple versions of MySQL, PostgreSQL, Python, Ruby, and Tomcat.

Please review your settings and click **Launch** to finish or **Edit details** to make changes.

Instance Details

Name:	Type: t1.micro
Detailed Monitoring: No	Availability Zone: No preference
Shutdown Behaviour: Stop	Termination Protection: No
Launch into VPC: No	

Security Details

Key Pair: AWS Key Pair	Security Group: quickaunch-1
------------------------	------------------------------

Advanced Details

Kernel ID: Default	Ramdisk ID: Default
User Data:	IAM Role: ?
Network Interfaces:	

DO NOT CLICK LAUNCH YET.

Click “Edit Details”.

Go Back

Edit details **Launch** ▶



I said don't launch yet!!!!!!

It's okay if you did.

You just have to terminate
your server and create a new one.

We'll take care of that in a few slides.

Now, for those of you
who were patient...

EC2 Dashboard
Events
Tags

INSTANCES
Instances
Spot Requests
Reserved Instances

IMAGES
AMIs
Bundle Tasks

ELASTIC BLOCK STORE
Volumes
Snapshots

NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
Network Interfaces

Create a New Instance

Ubuntu Server 12.04.2 LTS (ami-d0f89fb9)

Platform: Ubuntu Ubuntu Server 12.04.2 LTS with support available from Canonical
Architecture: x86_64 (<http://www.ubuntu.com/cloud/services>).

Click **Save details** in order to save your changes and return to the review screen.

Instance Details

Modify Tags

Security Settings

Security groups determine whether a network port is open or blocked on your instances. You may use an existing security group, or we can help you create a new security group to allow access to your instances.

Create new Security Group

Select Existing Security Groups

Custom
default
quicklaunch-1
The Basics

(Selected groups: The Basics)

Advanced Details

Storage Device Configuration

Save details **Launch ➔**

**Go to Security Settings.
Select your Security Group.
Click “Save Details.”**

EC2 Dashboard
Events
Tags

INSTANCES
Instances
Spot Requests
Reserved Instances

IMAGES
AMIs
Bundle Tasks

ELASTIC BLOCK STORE
Volumes
Snapshots

NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
Network Interfaces

Create a New Instance

Amazon Linux AMI 2013.03.1 (ami-05355a6c)

Platform: Amazon Linux Architecture: x86_64

The Amazon Linux AMI is an EBS-backed, PV-GRUB image. It includes Linux 3.4, AWS tools, and repository access to multiple versions of MySQL, PostgreSQL, Python, Ruby, and Tomcat.

Please review your settings and click **Launch** to finish or **Edit details** to make changes.

Instance Details

Name:	Type: t1.micro
Detailed Monitoring:	No
Shutdown Behaviour:	Stop
Launch into a VPC:	No
Availability Zone:	No preference
Termination Protection:	No

Security Details

Key Pair: AWS Key Pair	Security Group: quicklaunch-1
------------------------	-------------------------------

Advanced Details

Kernel ID: Default	Ramdisk ID: Default
User Data:	IAM Role: ?
Network Interfaces:	

Go Back **Edit details** **Launch** 

NOW you can launch.

EC2 Dashboard
Events
Tags

Launch Instance Actions



Viewing: All Instances All Instance Types Search

1 to 4 of 4 Instances

INSTANCES
Instances
Spot Requests
Reserved Instances

IMAGES
AMIs

Bundle Tasks

ELASTIC BLOCK STORE
Volumes
Snapshots

NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
Network Interfaces

	Name	Instance	AMI ID	Root Device	Type	State	Status Checks	Alarm Status	Monitoring	Security Groups	Key Pa
<input type="checkbox"/>	PHP Box	i-505f5334	ami-baba68d3	ebs	t1.micro	● stopped		none	basic	Custom	sandbox
<input type="checkbox"/>	Freelance	i-b27e5ed5	ami-baba68d3	ebs	t1.micro	● stopped		none	basic	Custom	freelanc
<input checked="" type="checkbox"/>	The Banana Stand	i-7057cf1e	ami-d0f89fb9	ebs	t1.micro	● running	✓ 2/2 checks pa	none	basic	The Basics	AWS K
<input type="checkbox"/>	Whoops.	i-04e3566f	ami-d0f89fb9	ebs	t1.micro	● terminated		none	basic	quicklaun	AWS K

Click Instances on the far left.

1 EC2 Instance selected.

EC2 Instance: The Banana Stand (i-7057cf1e) ●

ec2-54-234-29-168.compute-1.amazonaws.com

Description Status Checks Monitoring Tags

AMI:
ubuntu/images/ebs/ubuntu-precise-12.04-amd64-server-20130411.1 (ami-d0f89fb9)

Alarm Status:
none

Zone:
us-east-1b

Security Groups:
The Basics. view rules

Type:
t1.micro

State:
running

EC2 Dashboard
Events
Tags

Launch Instance Actions

Viewing: All Instances All Instance Types Search

1 to 4 of 4 Instances

Instances	Name	Instance	AMI ID	Root Device	Type	State	Status Checks	Alarm Status	Monitoring	Security Groups	Key Pa
Instances	PHP Box	i-505f5334	ami-baba68d3	ebs	t1.micro	stopped		none	basic	Custom	sandbox
Spot Requests	Freelance	i-b27e5ed5	ami-baba68d3	ebs	t1.micro	stopped		none	basic	Custom	freelanc
Reserved Instances	The Banana Stand	i-7057cf1e	ami-d0f89fb9	ebs	t1.micro	running	2/2 checks pa	none	basic	The Basics	AWS Ke
AMIs	Whoops	i-04e3566f	ami-d0f89fb9	ebs	t1.micro	terminated		none	basic	quicklaun	AWS Ke

Then select your server.

1 EC2 Instance selected.

EC2 Instance: The Banana Stand (i-7057cf1e) ●

ec2-54-234-29-168.compute-1.amazonaws.com

Description Status Checks Monitoring Tags

AMI:
ubuntu/images/ebs/ubuntu-precise-12.04-amd64-server-20130411.1 (ami-d0f89fb9)

Alarm Status:
none

Zone:
us-east-1b

Security Groups:
The Basics. view rules

Type:
t1.micro

State:
running

EC2 Dashboard
Events
Tags

Launch Instance Actions

Viewing: All Instances All Instance Types Search

1 to 4 of 4 Instances

INSTANCES
Instances
Spot Requests
Reserved Instances

IMAGES
AMIs
Bundle Tasks

ELASTIC BLOCK STORE
Volumes
Snapshots

NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
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	Freelance	i-b27e5ed5	ami-baba68d3	ebs	t1.micro	stopped		none	basic	Custom	freelanc
	The Banana Stand	i-7057cf1e	ami-d0f89fb9	ebs	t1.micro	running	2/2 checks pa	none	basic	The Basics	AWS K
	Whoops.	i-04e3566f	ami-d0f89fb9	ebs	t1.micro	terminated		none	basic	quicklaun	AWS K

Jot this nonsense down.
It's the URL to your server.

1 EC2 Instance selected.

EC2 Instance: The Banana Stand (i-7057cf1e)

ec2-54-234-29-168.compute-1.amazonaws.com

Description Status Checks Monitoring Tags

AMI: ubuntu/images/ebs/ubuntu-precise-12.04-amd64-server-20130411.1 (ami-d0f89fb9)

Zone: us-east-1b

Type: t1.micro

Alarm Status: none

Security Groups: The Basics. view rules

State: running

EC2 Dashboard
Events
Tags

Launch Instance Actions



Viewing: All Instances All Instance Types Search

1 to 4 of 4 Instances

Instances	Name	Instance	AMI ID	Root Device	Type	State	Status Checks	Alarm Status	Monitoring	Security Groups	Key Pa
Instances	PHP Box	i-505f5334	ami-baba68d3	ebs	t1.micro	stopped		none	basic	Custom	sandbox
Spot Requests	Freelance	i-b27e5ed5	ami-baba68d3	ebs	t1.micro	stopped		none	basic	Custom	freelanc
Reserved Instances	The Banana Stand	i-7057cf1e	ami-d0f89fb9	ebs	t1.micro	running	2/2 checks pa	none	basic	The Basics	AWS Ke
AMIs	Whoops.	i-04e3566f	ami-d0f89fb9	ebs	t1.micro	terminated		none	basic	quicklaun	AWS Ke

Make sure you have
the correct Security Group.

Click “View Rules”.

1 EC2 Instance selected.

EC2 instance The Banana Stand i-7057cf1e

ec2-54-234-29-168.compute-1.amazonaws.com

Description Status Checks Monitoring Tags

AMI: ubuntu/images/ebs/ubuntu-precise-12.04-amd64-server-20130411.1 (ami-d0f89fb9)

Zone: us-east-1b

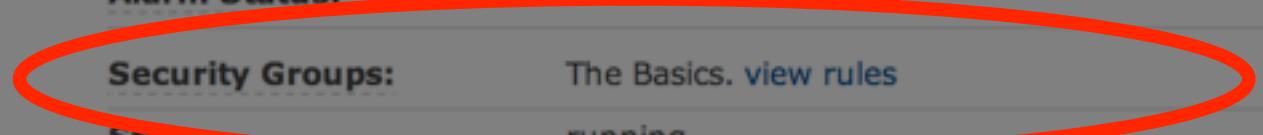
Type: t1.micro

Alarm Status: none

Security Groups: The Basics. view rules

State: running

Security Groups: The Basics. view rules



EC2 Dashboard
Events
Tags

INSTANCES
Instances
Spot Requests
Reserved Instances

IMAGES
AMIs
Bundle Tasks

ELASTIC BLOCK STORE
Volumes
Snapshots

NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
Network Interfaces

Launch Instance Actions

Viewing: All Instances

Instance Management

- Connect
- Get System Log
- Get Windows Admin Password
- Create Image (EBS AMI)
- Add/Edit Tags
- Change Security Group
- Change Source/Dest. Check
- Bundle Instance (instance store AMI)
- Launch More Like This
- Disassociate IP Address
- Change Termination Protection
- View/Change User Data
- Change Instance Type
- Change Shutdown Behavior
- Attach Network Interface
- Detach Network Interface
- Manage Secondary IP Address

Actions

1 EC2 Instance selected

EC2 Instance ec2-54-234-29

- Terminate (circled in red)
- Reboot
- Stop
- Start

Description

AMI: ubuntu/images/ubuntu-12.04-amd64-2011-11-29-14-41-10.vhd

Zone:

Type: t1.micro

CloudWatch Monitoring

- Enable Detailed Monitoring
- Disable Detailed Monitoring
- Add/Edit Alarms

If something is wrong, kill your server via the Actions dropdown.

Root Device	Type	State	Status Checks	Alarm Status	Monitoring	Security Groups	Key Pair
ebs	t1.micro	● stopped		none	basic	Custom	sandbox
ebs	t1.micro	● stopped		none	basic	Custom	freelance
ebs	t1.micro	● running	✓ 2/2 checks passed	none	basic	The Basics	AWS Key
ebs	t1.micro	● terminated		none	basic	quicklaunch-1	AWS Key

e) ●

0411.1 (ami-d0f89fb9)

Alarm Status: none

Security Groups: The Basics. view rules

State: running



Terminate at will.
Terminate just to practice.

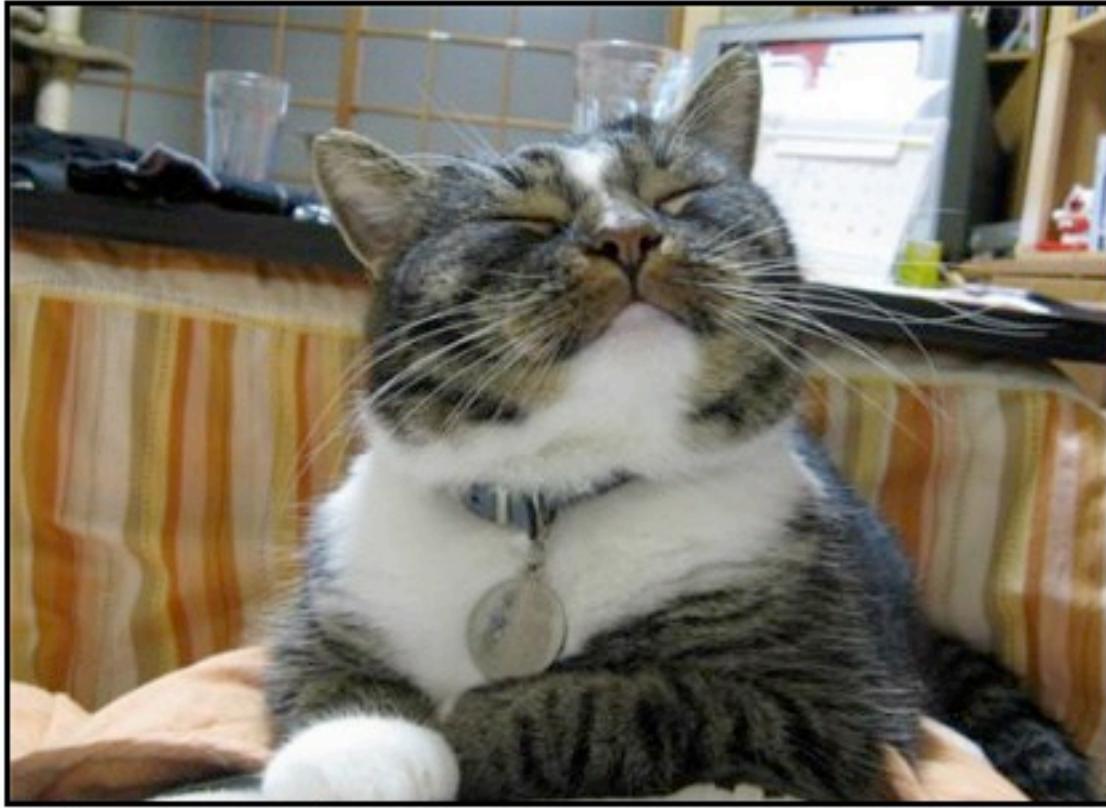


You're making virtual computers that cost
\$0.0000000001 to spin up and run for a second.



If you mess up at any point it's okay.

but besides that...



PROUD CAT

is proud

You launched a cloud computer!

...now what?

Connect to your server

We need to open Terminal for this.

Windows users - Putty and WinSCP - <http://bit.ly/1YXodh>

Y
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THE DREAM WORLD MANAGEMENT

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アーティスティックな文部省の新書を日本で初めて出版する
ヨハネス・マテウス・メロウ

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Y O U R M A L L P A P E R . C O M

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A ROUND-ROUNDED YOU WATCH TELEVISION

TRIX IS ALL AROUND US. IT'S THERE.

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AROUND US IT IS THERE WHEN YOU ARE AROUND US IT IS THERE WHEN YOU ARE

Actually, more like this:



jkosoy — %1

Last login: Fri Sep 6 12:02:53 on ttys001

~
20:57:55 jkosoy@arbitrary \$

Terminal (aka the command line) is
like your GUI but with text.

Let's try it out.

```
cd ~/Desktop
```

- **cd** = “change directory”. Like clicking to a folder.
- **~/Desktop** = what folder we’re going to.

~ is a shortcut for /Users/your-username

open .

- **open** = opens a finder window.
- **.** = The directory we want to open.
. is a shortcut for the current directory. kinda like in CSS, how you can say `./img/bananas.jpg`

`cd ~/Downloads`

(or `cd /wherever/you/put/that/pem/file/we/downloaded/earlier`)

```
chmod 0600 ./yourKey.pem
```

This “changes permissions” on your key pair.
This is some voodoo we need to do but isn’t worth explaining right now.

Log into your server.

```
ssh ubuntu@whatever.amazonaws.com -i ~/Downloads/yourKey.pem
```

There are spaces in that command.

```
ssh  
ubuntu@whatever.amazonaws.com  
-i  
~/Downloads/yourKey.pem
```

Breaking that down

- `ssh` = log into the server but on the command line. Think FTP.
- `ubuntu@whatever.amazonaws.com` = `username@address.com`

`ubuntu` is the default username for a new instance.

- `-i ~/Downloads/yourKey.pem` = identity file argument
 - Tells SSH to log in with credentials encrypted in a file.
 - We will change this to username/password combos later.

<http://www.ubuntu.com/business/services/cloud>

Use Juju to deploy your cloud instances and workloads:

<https://juju.ubuntu.com/#cloud-precise>

0 packages can be updated.

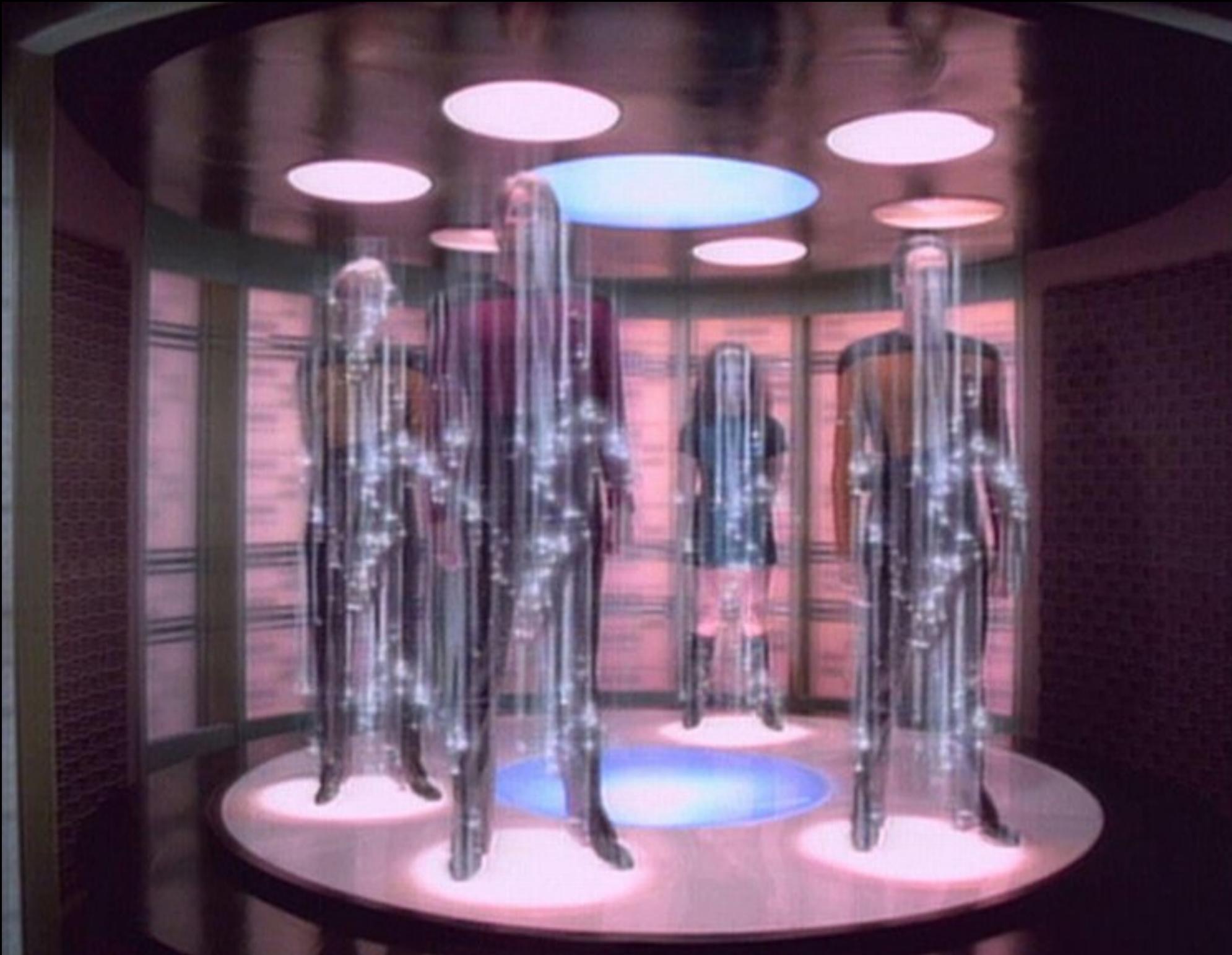
0 updates are security updates.

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-10-144-79-174:~\$



You have now remoted in.

Your command line is no longer your computer.

It is now your EC2 server.

Until you disconnect (Ctrl+D) you are on that machine. You are not on your machine.

There is no GUI for your server.

It is all beautiful, glorious
command line.

Your server is just a
bare bones Linux computer.

It's kinda boring.

You know what you need?

Apps.

(More specifically, software that
makes your server uniquely yours.)

The most obvious use is to serve web pages, so let's start there.

But with all this command line
wackiness I'll bet it's super hard to
install apps... right?

Wrong.

There's a command line
app store. Seriously.

Sort of.

Advanced Packaging Tool.

Also known as APT.

Advanced Packaging Tool.

- `apt-get update` = update APTs database.
- `apt-get upgrade` = actually upgrades your software
- `apt-get install something` = install a program.
- `apt-get help` = get more information about the apt-get program



Upgrade new instances right away!

```
sudo apt-get update  
sudo apt-get upgrade
```

...and every so often.

Like any other software, you want to stay up to date.
Just be mindful that upgrading can also impact web sites and old source code.

Let's install Apache.

Apache is web server software.
It's like Finder for the WWW. It's the engine behind > 100 million web sites.

sudo apt-get install apache2

Then press Enter when it prompts you to proceed to download and install.

(that's it)

What you just did:

- **sudo** = super user “do”. sudo means that the computer is your bitch.
- You need permission to sudo. In this case Amazon pre-configured it.
- **apt-get** = the command line program to run, our package manager
- **install** = what we want the program to do. Bet you can guess this one.
- **apache2** = what to install. (or more abstractly a program argument.)

Let's test out your server.

In your browser now...

<http://whatever.amazonaws.com>



ITS PEANUT BUTTER JELLY TIME!!!

Install some more stuff

- sudo apt-get install mysql-server mysql-client
- sudo apt-get install php5 php5-dev libapache2-mod-php5 php5-curl
php5-gd php5-idn php-pear php5-imagick php5-imap php5-mcrypt
php5-memcache php5-ps php5-pspell php5-recode php5-snmp php5-
tidy php5-xmlrpc php5-xsl php5-common

(copy this one from <http://www.giantflyingsaucer.com/blog/?p=1826>)

Having fun yet?

Don't know the
name of a package?

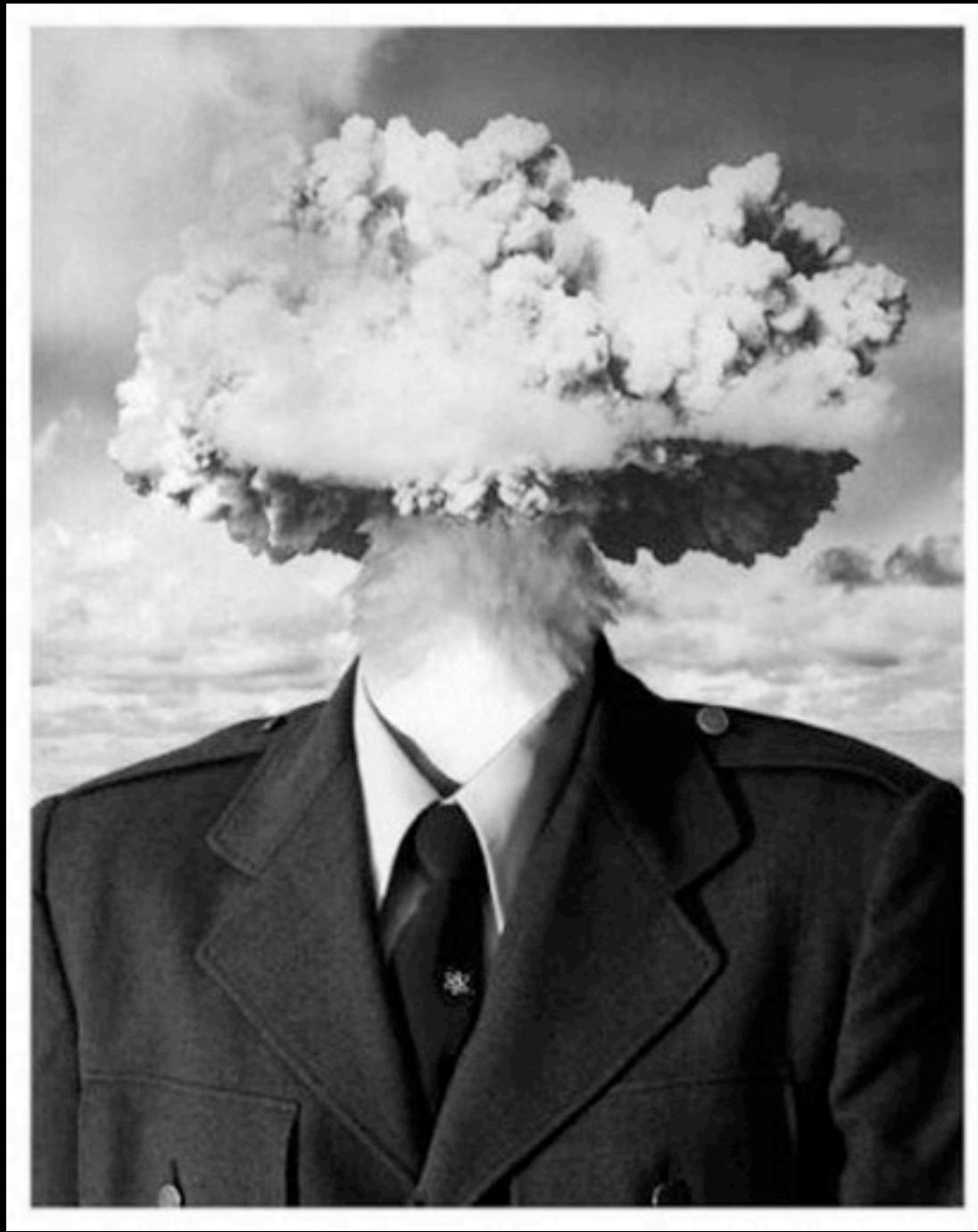
Google “apt-get install [name of thing you're trying to install]”

Give it a shot.

There's a program called cowsay for Linux. I want you to install it right now.

Once it's done try this command:

cowsay Web 3001



Now let's set up SFTP.

First we need credentials.

```
sudo useradd -m [username]
```

```
sudo passwd [username]
```

-m creates a home directory for that user.

You'll need to enter the password twice. It won't show up on the screen.

Give yourself sudo access.

`sudo visudo`

```
#  
# This file MUST be edited with the 'visudo' command as root.  
#  
# Please consider adding local content in /etc/sudoers.d/ instead of  
# directly modifying this file.  
#  
# See the man page for details on how to write a sudoers file.  
#  
Defaults env_reset  
Defaults secure_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:  
  
# Host alias specification  
  
# User alias specification
```

^G Get Help
^X Exit

^O WriteOut
^J Justify

^R Read File
^W Where Is

[Read 29 lines
^Y Prev
^V Next

```
# User privilege specification
root    ALL=(ALL:ALL) ALL
jkosoy  ALL=(ALL:ALL) ALL

# Members of the admin group may gain root privileges
%admin  ALL=(ALL:ALL) ALL
```

Add your username this file.

```
# Allow members of group sudo to execute any command
%sudo   ALL=(ALL:ALL) ALL
        Scroll down til you find the line that says root ALL=(ALL:ALL) ALL
        On the next line down type the same thing, replacing root with your username.

# See sudoers(5) for more information on "#include" directives:
```

```
#includedir /etc/sudoers.d
```

^G Get Help
^X Exit

^O WriteOut
^J Justify

^R Read File
^W Where Is

^Y Prev
^V Next

Save and Quit

Ctrl+O

(hit enter)

Ctrl+X

Test it out

```
su yourName  
(enter password)  
sudo ls  
(enter password again)  
Ctrl+D
```

What that all means

- `su yourUserName` = switch to this username.
- once you've switched, you have now transformed from user “ubuntu” to user “yourUserName”
- `ls` = list directory contents. we don't need to sudo for that, but we did just to test. :)
- `Ctrl+D` = disconnect. In this case it'll switch you back to user “ubuntu”

Edit SSHD settings

- `sudo nano /etc/ssh/sshd_config`
 - Set port from 22 to 30000.
 - `PermitRootLogin` should be `no`
 - `PasswordAuthentication` should be `yes`
 - `Ctrl+O`
 - `Ctrl+X`

Translation

- open up a file called `sshd_config` inside of `/etc/ssh/`. This is a configuration file for SFTP and SSH.
 - Remember that secret port from our Security Group setting on Amazon? Yep, we're using that instead of the default port (22) for SSH now.
 - We turned off the ability to log in as the root user.
 - We allow users to SSH in using a username and password on the server.
 - Save
 - Quit

Why did we do this?

Security. Now only your username and password can log in.

What's with the /etc folder?

On Linux, the etc directory is sort of like a Documents directory for configuration files.

http://en.wikipedia.org/wiki/Unix_directory_structure

Restart SSH

```
sudo /etc/init.d/ssh restart
```

(aside)

You can restart lots of services with this.
Whenever you change a config file you probably need a restart.

For example:
`sudo /etc/init.d/apache2 restart`

One last thing...

Set up the WWW directory so we can edit it.

Create a group

```
sudo groupadd webadmin  
sudo usermod -a -G webadmin [yourname]  
sudo usermod -a -G webadmin root
```

Edit the WWW directory

```
sudo chown -R root:webadmin /var/www
```

```
sudo chmod -R 775 /var/www
```

Untitled

 Quick Look  Action  Sync

 Favorites

Search

 Favorites

 FTP

 SFTP

 S3

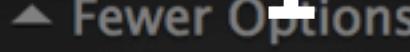
 WebDAV

Protocol:  SFTP

Server: ec2-23-20-42-208.compute-1.amazonaws.com

User Name: jkosoy

Password:   Ask each time



Port: 30000  Use passive mode

Root URL: http://www.domain.com/ (optional)

Remote Path: /

Local Path: ~/Sites/domain (optional) 

Use DockSend 

In the Finder, drag files or folders from the Local Path (above) to the Transmit dock icon. They will then be automatically mirrored to this server.

Open your favorite FTP program.

Quick Look Action Sync

Favorites

Search

Favorites

FTP

SFTP

S3

WebDAV

Protocol: **SFTP**

Server: **ec2-23-20-42-208.compute-1.amazonaws.com**

User Name: **jkosoy**

Password: **.....**



Ask each time

▼ Fewer Options

Port: **30000** **Use passive mode**

Root URL: **http://www.domain.com/ (optional)**

Remote Path: **/**

Local Path: **~/Sites/domain (optional)**

Set...

Use DockSend

In the Finder, drag files or folders from the Local Path (above) to the Transmit dock icon. They will then be automatically mirrored to this server.

Set the protocol to SFTP

Quick Look Action Sync

Favorites

Search

Favorites

FTP

SFTP

S3

WebDAV

Set the server to your AWS URL

Protocol: SFTP

Server: ec2-23-20-42-208.compute-1.amazonaws.com

User Name: jkosoy

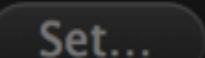
Password:  Ask each time

 Fewer Options

Port: 30000 Use passive mode

Root URL: http://www.domain.com/ (optional)

Remote Path: /

Local Path: ~/Sites/domain (optional) 

Use DockSend 

In the Finder, drag files or folders from the Local Path (above) to the Transmit dock icon. They will then be automatically mirrored to this server.

Quick Look Action Sync

Favorites

Search

Favorites

FTP

SFTP

S3

WebDAV

Protocol: SFTP

Server: ec2-23-20-42-208.compute-1.amazonaws.com

User Name: jkosoy

Username and Password
are what you set via the command line.

Port: 30000 Use passive mode

Root URL: http://www.domain.com/ (optional)

Remote Path: /

Local Path: ~/Sites/domain (optional)

Set...

Use DockSend

In the Finder, drag files or folders from the Local Path (above) to the Transmit dock icon. They will then be automatically mirrored to this server.

Quick Look Action Sync

Favorites

Search

Favorites

FTP

SFTP

S3

WebDAV

Protocol: SFTP

Server: ec2-23-20-42-208.compute-1.amazonaws.com

User Name: jkosoy

Password:  Ask each time

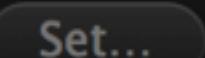
Port 30000

 Fewer Options

Port: 30000 Use passive mode

Root URL: http://www.domain.com/ (optional)

Remote Path: /

Local Path: ~/Sites/domain (optional) 

Use DockSend 

In the Finder, drag files or folders from the Local Path (above) to the Transmit dock icon. They will then be automatically mirrored to this server.



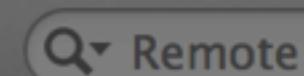
Quick Look



Action



Sync



Remote

Search



/

bin

boot

dev

etc

home

initrd.img

lib

lib64

lost+found

media

mnt

opt

proc

root

run

sbin

selinux

srv

sys

tmp

Disco.



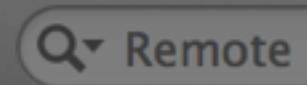
Quick Look



Action



Sync



Remote

Search

Your web root directory is /var/www



- bin
- boot
- dev
- etc
- home
- initrd.img
- lib
- lib64
- lost+found
- media
- mnt
- opt
- proc
- root
- run
- sbin
- selinux
- srv
- sys
- tmp

That's it!

You did it! You built a server from scratch!
(Specifically a LAMP stack.)

```
ssh you@whatever.amazonaws.com -p 30000
```

You don't need that PEM file anymore.

Now you can SSH in with your username. You'll be prompted for your password.

Bonus: Useful Linux Commands

- ls = list files
- ls -la = list files a little bit more organized
- pwd = print working directory. the directory you are currently in.
- cd /path/to/directory = change directory
 - Use tab to autocomplete.
- mkdir dir = make a directory
- chmod permissions dirOrFile = change the read/write permissions. complicated.
- chown user:group dirOrFile = change the owner of a file. also complicated
- Ctrl+D or Ctrl+C usually quits something. I always forget which is which.
- Cmd+T creates new tabs. Useful for having one remote connection and one local.

Percolations for your Brain Grapes

- Rails is a very popular platform these days. Perhaps install that?
- Or perhaps you want an all JavaScript solution. NodeJS + MongoDB.
- I know some of you are Django and Python nuts. Go on... Google it. You know you want to.
- Linux geek and hate Ubuntu? That's fine. Use another flavor. You won't hurt my feelings.

Other Options

- Google AppEngine
- Heroku
- Pagadabox
- Hosting via Amazon S3

Homework

- Terminate your server and rebuild it from scratch. Practice makes perfect.
- Upload your web site from Week 1 on that server.
- Post on Talker some neat things you installed and how you did them.

Questions?