

Linux 101

Sung Kim

Good morning!



AWS EC2!

Create your account now!



Amazon Web Services

Compute

- EC2**
Virtual Servers in the Cloud
- EC2 Container Service**
Run and Manage Docker Containers
- Elastic Beanstalk**
Run and Manage Web Apps
- Lambda**
Run Code in Response to Events

Storage & Content Delivery

- S3**
Scalable Storage in the Cloud
- CloudFront**
Global Content Delivery Network
- Elastic File System** PREVIEW
Fully Managed File System for EC2
- Glacier**
Archive Storage in the Cloud
- Storage Gateway**
Integrates On-Premises IT Environments with Cloud Storage

Developer Tools

- CodeCommit**
Store Code in Private Git Repositories
- CodeDeploy**
Automate Code Deployments
- CodePipeline**
Release Software using Continuous Delivery

Management Tools

- CloudWatch**
Monitor Resources and Applications
- CloudFormation**
Create and Manage Resources with Templates
- CloudTrail**
Track User Activity and API Usage
- Config**
Track Resource Inventory and Changes
- OpsWorks**
Automate Operations with Chef

Mobile Services

- Cognito**
User Identity and App Data Synchronization
- Device Farm**
Test Android, Fire OS, and iOS apps on real devices in the Cloud
- Mobile Analytics**
Collect, View and Export App Analytics
- SNS**
Push Notification Service

Application Services

- API Gateway**
Build, Deploy and Manage APIs
- AppStream**
Low Latency Application Streaming
- CloudSearch**
Managed Search Service
- Elastic Transcoder**
Easy-to-use Scalable Media Transcoding

AWS EC2!

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Tag Instance 6. Configure Security Group 7. Review

Step 1: Choose an Amazon Machine Image (AMI)

[Cancel and Exit](#)

Community AMIs

Free tier only [\(i\)](#)

Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.

Root device type: ebs Virtualization type: hvm



Red Hat

Free tier eligible

Red Hat Enterprise Linux 7.1 (HVM), SSD Volume Type - ami-4dbf9e7d

[Select](#)

64-bit



SUSE Linux

Free tier eligible

SUSE Linux Enterprise Server 12 (HVM), SSD Volume Type - ami-d7450be7

[Select](#)

64-bit



Ubuntu

Free tier eligible

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

[Select](#)

64-bit

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

AWS EC2!

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Tag Instance 6. Configure Security Group 7. Review

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
<input checked="" type="checkbox"/>	General purpose	t2.micro Free tier eligible	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 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

Step 7: Review Instance Launch

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

[Edit AMI](#)

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

Free tier eligible

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

[Edit 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

[Edit security groups](#)

Security group name

launch-wizard-1

Description

launch-wizard-1 created 2015-09-02T20:53:58.101+08:00

Type i	Protocol i	Port Range i	Source i
SSH	TCP	22	0.0.0.0/0

[Cancel](#) [Previous](#) [Launch](#)

AWS EC2!

Select an existing key pair or create a new key pair

X

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](#).

Choose an existing key pair



Select a key pair

hunkim-key



I acknowledge that I have access to the selected private key file (hunkim-key.pem), and that without this file, I won't be able to log into my instance.

Cancel

Launch Instances

Launch Status



Your instances are now launching

The following instance launches have been initiated: [i-b6502a73](#) [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 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](#)
- [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](#)

[View Instances](#)

Connect To Your Instance



I would like to connect with A standalone SSH client

A Java SSH Client directly from my browser (Java required)

To access your instance:

1. Open an SSH client. (find out how to [connect using PuTTY](#))
2. Locate your private key file (hunkim-key.pem). The wizard automatically detects the key you used to launch the instance.
3. Your key must not be publicly viewable for SSH to work. Use this command if needed:

chmod 400 hunkim-key.pem

4. Connect to your instance using its Public IP:

52.26.184.207

Example:

ssh -i "hunkim-key.pem" ubuntu@52.26.184.207

Please note that in most cases the username above will be correct, however please ensure that you read your AMI usage instructions to ensure that the AMI owner has not changed the default AMI username.

If you need any assistance connecting to your instance, please see our [connection documentation](#).

Close

```
delete mode 100644 app/app.iml
Sungs-MacBook-Pro:questionsAndroid hunkim$ ssh -i ~/.ssh/hunkim-key.pem ubuntu@52.26.184.207
The authenticity of host '52.26.184.207 (52.26.184.207)' can't be established.
RSA key fingerprint is 0e:e9:32:fa:b5:4a:a3:f7:3f:e8:37:14:0e:1a:fc:46.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '52.26.184.207' (RSA) to the list of known hosts.
Welcome to Ubuntu 14.04.2 LTS (GNU/Linux 3.13.0-48-generic x86_64)
```

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

System information as of Wed Sep 2 12:57:33 UTC 2015

System load: 0.16	Memory usage: 5%	Processes: 82
Usage of /: 9.8% 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.

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

WARNING! Your environment specifies an invalid locale.

This can affect your user experience significantly, including the
ability to manage packages. You may install the locales by running:

`sudo apt-get install language-pack-UTF-8`

or

`sudo locale-gen UTF-8`

To see all available language packs, run:

`apt-cache search "language-pack-[a-z][a-z]$"`

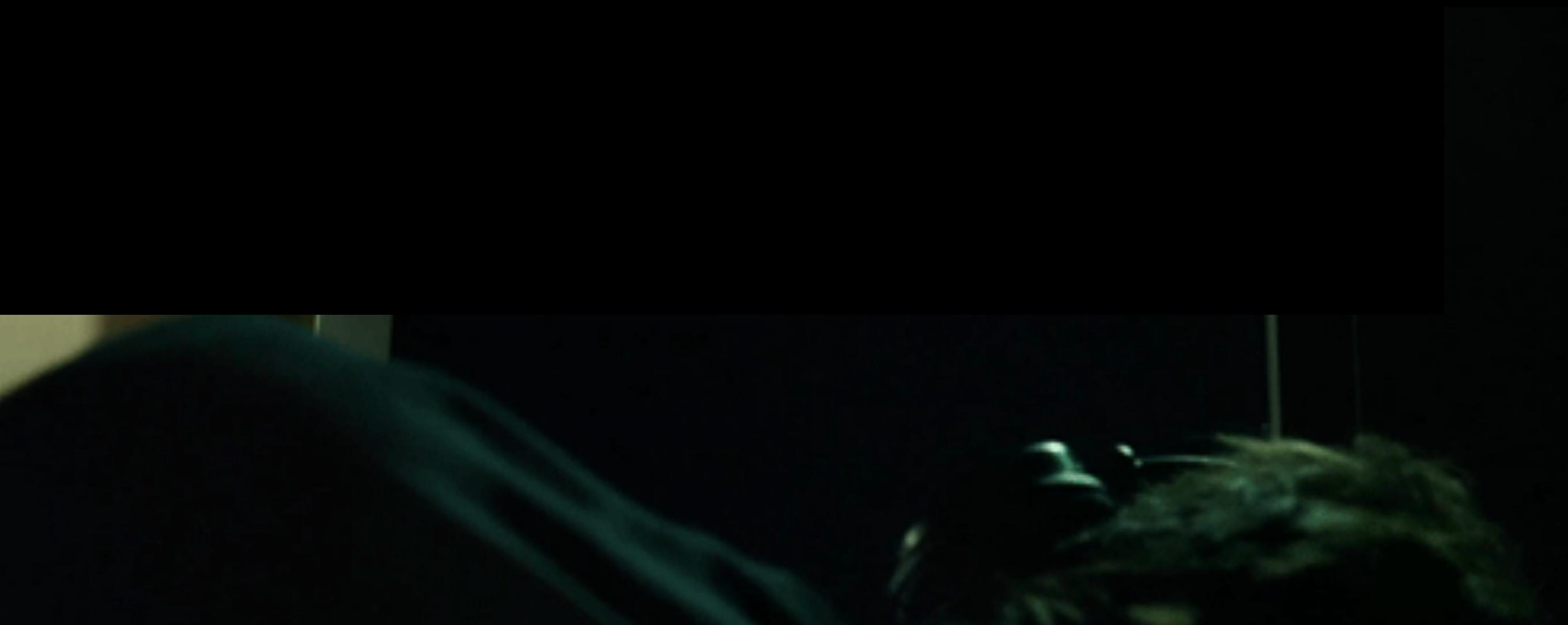
To disable this message for all users, run:

`sudo touch /var/lib/cloud/instance/locale-check.skip`

The Matrix has you...

Follow the white rabbit...

Knock knock, Neo. █



q.comp3lll.xyz

- What is your favourite (or useful) linux command line?

The Art of Command Line



This repository

Search

Explore

Features

Enterprise

Pricing

Sign up

Sign in



jlevy / the-art-of-command-line

Watch

786

Star

19,160

Fork

1,533

Master the command line, in one page

478 commits

1 branch

0 releases

72 contributors



Branch: master ▾

the-art-of-command-line / +

Code

Issues

27

Pull requests

40

Pulse

Graphs

Merge pull request #279 from peterkokot/patch-sl ...

jlevy authored 14 days ago

latest commit db74470335

.gitignore

final fixes for spmbt's revision

2 months ago

README-es.md

es: correction of typos and plurals.

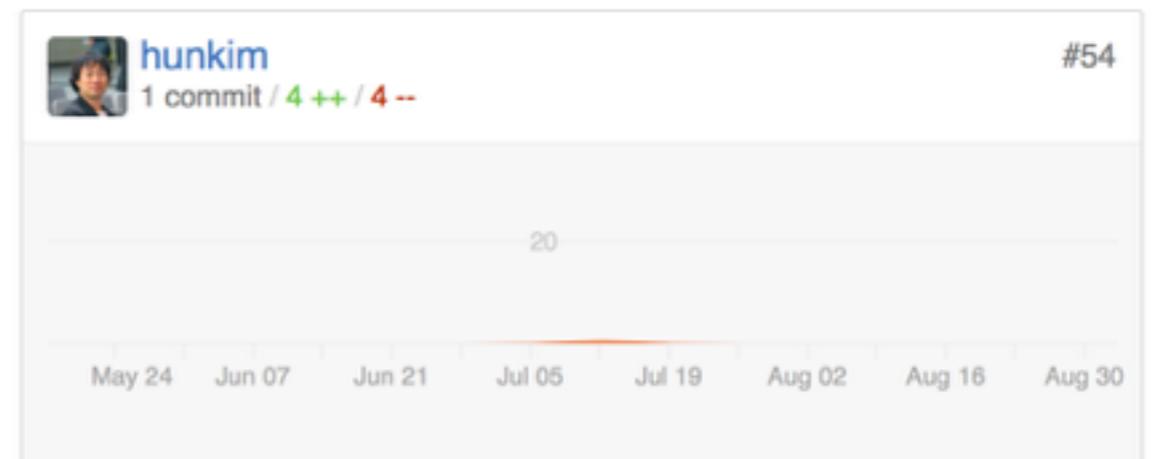
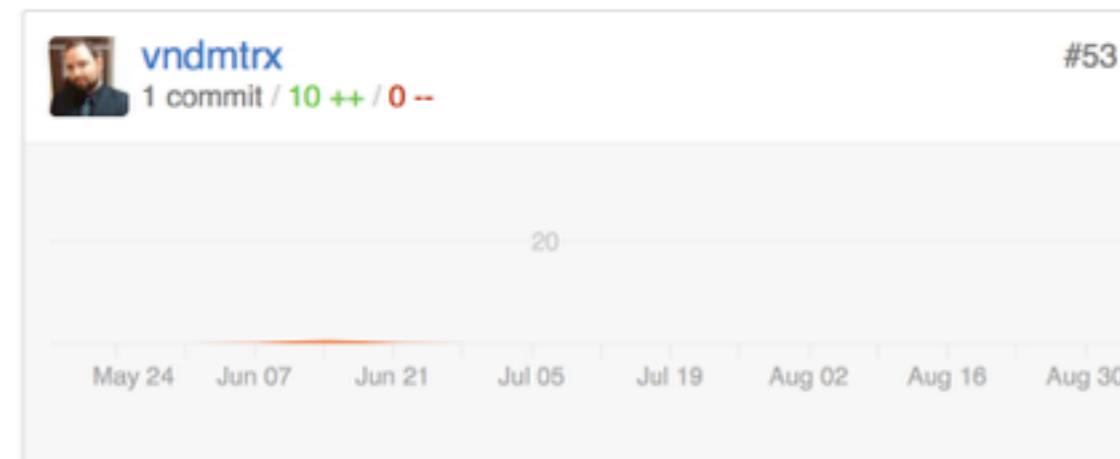
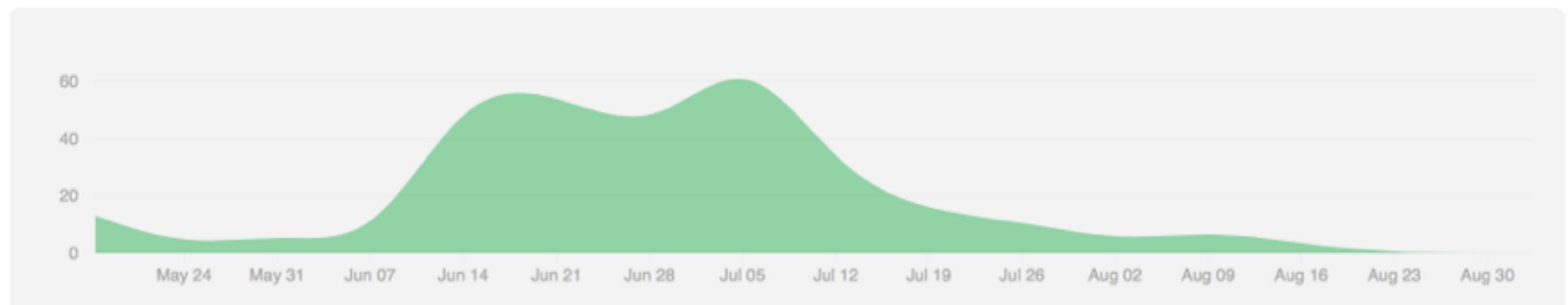
a month ago

[Contributors](#)[Commits](#)[Code frequency](#)[Punch card](#)[Network](#)[Members](#)

May 17, 2015 – Sep 2, 2015

Contributions: [Commits](#) ▾

Contributions to master, excluding merge commits



Basics

- Learn basic Bash. Actually, type ‘`man bash`’ and at least skim the whole thing
- Learn at least one text-based editor well. Ideally Vim (`vi`)
- Know how to read documentation with `man`
- Learn about redirection of output and input using `>` and `<` and pipes using `|`.
- Know `>` overwrites the output file and `>>` appends.
- Learn about file glob expansion with `*` (and perhaps `?`)

ssh

- Know `ssh`, and the basics of passwordless authentication, via `ssh-agent`, `ssh-add`, etc.

Everything is a file

https://en.wikipedia.org/wiki/Everything_is_a_file

- ls and ls -l (in particular, learn what every column in ls -l means),
- less, head, tail and tail -f (or even better, less +F),
- ln and ln -s (learn the differences and advantages of hard versus soft links),
- chown, chmod,
- du (for a quick summary of disk usage: du -hs *).
- For filesystem management, df, mount, fdisk, mkfs, lsblk.

Checkout more at

<https://github.com/jlevy/the-art-of-command-line>

<https://www.codecademy.com/en/courses/learn-the-command-line>

The screenshot shows a terminal window on the Codecademy platform. The terminal title is "ls -alt". The output of the command is displayed in a dark blue box:

```
$ ls -alt
drwxr-xr-x 4 cc eng 4096 Jun 29
12:22 .
-rw-r--r-- 1 cc eng    0 Jun 29
12:22 .gitignore
drwxr-xr-x 5 cc eng 4096 Jun 30
14:20 ..
drwxr-xr-x 2 cc eng 4096 Jun 29
12:22 satire
drwxr-xr-x 2 cc eng 4096 Jun 29
12:22 slapstick
-rw-r--r-- 1 cc eng   14 Jun 29
12:22 the-office.txt
```

To the left of the terminal window, there is a sidebar with the "Learn" tab selected. Below the terminal window, there is explanatory text and two interactive buttons:

The `-t` option orders files and directories by the time they were last modified.

Instructions

Report a Bug

apt-get update & apt-get upgrade

```
Last login: Fri Sep  4 12:51:17 2015 from dy091-005.ust.hk
ubuntu@ip-172-31-17-193:~$ pwd
/home/ubuntu
ubuntu@ip-172-31-17-193:~$ sudo apt-get update
Ign http://ap-southeast-1.ec2.archive.ubuntu.com trusty InRelease
Ign http://ap-southeast-1.ec2.archive.ubuntu.com trusty-updates InRelease
```

```
ubuntu@ip-172-31-17-193:~$ sudo apt-get upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following packages have been kept back:
  linux-headers-generic linux-headers-virtual linux-image-virtual
    linux-virtual
The following packages will be upgraded:
  accountsservice apparmor apport apt apt-transport-https apt-utils base-files
  bash-completion bind9-host bsdutils cloud-init curl dh-python dnsutils dpkg
  fuse gcc-4.8-base gdisk gnupg gpgv grub-common grub-legacy-ec2 grub-pc
  grub-pc-bin grub2-common initscripts iproute2 irqbalance isc-dhcp-client
  isc-dhcp-common libaccountsservice0 libapparmor-perl libapparmor1
  libapt-inst1.5 libapt-pkg4.12 libbind9-90 libblkid1 libcurl3 libcurl3-gnutls
  libdns100 libdrm2 libexpat1 libfuse2 libgcrypt11 libicu52 libisc95
  libisccc90 libiscfg90 libldap-2.4-2 liblwres90 libmount1 libnuma1
  libnsm-systemd libparted0debian1 libpcre3 libpolkit-agent-1-0
```

LAMP?

LAMP:



Linux



Apache



PHP



Installing LAMP on Ubuntu



To install the default LAMP stack in Ubuntu 10.04 and above

First refresh your package index...

```
$ sudo apt-get update
```

... and then install the LAMP stack:

```
$ sudo apt-get install lamp-server^
```

Mind the caret (^) at the end.

```
ubuntu@ip-172-31-17-193:~$ sudo apt-get install lamp-server^
```

```
Reading package lists... Done
```

```
Building dependency tree
```

```
Reading state information... Done
```

```
Note, selecting 'mysql-server-core-5.5' for task 'lamp-server'
```

```
Note, selecting 'mysql-server-5.5' for task 'lamp-server'
```

```
Note, selecting 'libaio1' for task 'lamp-server'
```

```
Note, selecting 'mysql-client-core-5.5' for task 'lamp-server'
```

```
Note, selecting 'apache2-mpm-prefork' for task 'lamp-server'
```

```
Note, selecting 'libaprutil1' for task 'lamp-server'
```

```
Note, selecting 'libapache2-mod-php5' for task 'lamp-server'
```

```
php5-common php5-json php5-mysql php5-readline ssl-cert
```

```
upgraded, 27 newly installed, 0 to remove and 4 not upgraded.
```

```
Need to get 15.7 MB of archives.
```

```
After this operation, 123 MB of additional disk space will be used.
```

```
Do you want to continue? [Y/n] █
```

Configuring mysql-server-5.5

| While not mandatory, it is highly recommended that you set a password for the MySQL administrative "root" user.

| If this field is left blank, the password will not be changed.

| New password for the MySQL "root" user:

<0k>

It's running!

```
Module mpm_event disabled.  
Enabling module mpm_prefork.  
apache2_switch_mpm Switch to prefork  
 * Restarting web server apache2 [ OK ]  
apache2_invoke: Enable module php5  
 * Restarting web server apache2 [ OK ]  
Setting up php5-json (1.3.2-2build1) ...  
php5_invoke: Enable module json for cli SAPI  
php5_invoke: Enable module json for apache2 SAPI  
Processing triggers for libc-bin (2.19-0ubuntu6.6) ...  
ubuntu@ip-172-31-17-193:~$ █
```

```
ubuntu@ip-172-31-17-193:~$ ps -aux | grep apache  
root      31639  0.0  1.4 276216 15120 ?        Ss   11:59  0:00 /usr/sbin/apache2 -k start  
www-data  31643  0.0  0.5 276240  5840 ?        S    11:59  0:00 /usr/sbin/apache2 -k start  
www-data  31644  0.0  0.5 276240  5840 ?        S    11:59  0:00 /usr/sbin/apache2 -k start  
www-data  31645  0.0  0.5 276240  5840 ?        S    11:59  0:00 /usr/sbin/apache2 -k start  
www-data  31646  0.0  0.5 276240  5840 ?        S    11:59  0:00 /usr/sbin/apache2 -k start  
www-data  31647  0.0  0.5 276240  5840 ?        S    11:59  0:00 /usr/sbin/apache2 -k start  
ubuntu    31785  0.0  0.0  10436   932 pts/0     S+   12:12  0:00 grep --color=auto apache  
ubuntu@ip-172-31-17-193:~$ █
```

http://ec2-54-255-210-1.ap-southeast-1.compute.amazonaws.com

Launch Instance Connect Actions ▾

Filter by tags and attributes or search by keyword

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS
i-f3e00b3c	t2.micro	ap-southeast-1a	running	2/2 checks ...	None	ec2-54-255-210-1.ap-southeast-1.compute.amazonaws.com	

Instance: i-f3e00b3c Public DNS: ec2-54-255-210-1.ap-southeast-1.compute.amazonaws.com

Description Status Checks Monitoring Tags

Instance ID	i-f3e00b3c	Public DNS	ec2-54-255-210-1.ap-southeast-1.compute.amazonaws.com
Instance state	running	Public IP	54.255.210.1
Instance type	t2.micro	Elastic IP	-
Private DNS	ip-172-31-17-193.ap-southeast-1.compute.internal	Availability zone	ap-southeast-1a

Nothing?



ERROR

The requested URL could not be retrieved

The following error was encountered while trying to retrieve the URL: <http://ec2-54-255-210-1.ap-southeast-1.compute.amazonaws.com/>

Connection to 54.255.210.1 failed.

The system returned: *(110) Connection timed out*

The remote host or network may be down. Please try the request again.

Your cache administrator is cchelp@ust.hk.

Generated Mon, 07 Sep 2015 12:17:36 GMT by ustinx17.ust.hk (squid/3.1.20-20120626-r10456)

```
ubuntu@ip-172-31-17-193:~$ telnet 0 80
Trying 0.0.0.0...
Connected to 0.
Escape character is '^]'.
GET /
```

Security rule?

Security Groups associated with i-f3e00b3c

Ports	Protocol	Source	Actions
22	tcp	0.0.0.0/0	✓

Edit inbound rules

X

Type i	Protocol i	Port Range i	Source i	
HTTP	TCP	80	Anywhere	0.0.0.0/0 x
Add Rule	Cancel			Save

Yes!

← → C ec2-54-255-210-1.ap-southeast-1.compute.amazonaws.com



ubuntu

Apache2 Ubuntu Default Page

It works!

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully**



where is html directory LAMP ubuntu



Web

Images

Videos

News

More ▾

Search tools

About 449,000 results (0.94 seconds)

[lamp - Where to place my local website starting with the 2.4 ...](#)

[askubuntu.com/.../where-to-place-my-local-website-starting-with-the-2-4... ▾](http://askubuntu.com/.../where-to-place-my-local-website-starting-with-the-2-4...)

Apr 17, 2014 - I recently installed Ubuntu 14.04, then I installed lamp-server and placed my the `html` directory sudo mv /var/www/[!html]* /var/www/html # 2.

```
ubuntu@ip-172-31-17-193:~$ cd /var/www/html
```

```
ubuntu@ip-172-31-17-193:/var/www/html$ ls -la
```

```
drwxr-xr-x 2 root root 4096 Sep 7 11:59 .
```

```
drwxr-xr-x 3 root root 4096 Sep 7 11:58 ..
```

```
-rw-r--r-- 1 root root 11510 Sep 7 11:59 index.html
```

```
ubuntu@ip-172-31-17-193:/var/www/html$ mv index.html index.html.old
```

```
mv: cannot move 'index.html' to 'index.html.old': Permission denied
```

```
ubuntu@ip-172-31-17-193:/var/www/html$ sudo mv index.html index.html.old
```

```
ubuntu@ip-172-31-17-193:/var/www/html$ vi index.html
```

```
ubuntu@ip-172-31-17-193:/var/www/html$ touch index.html
```

```
touch: cannot touch 'index.html': Permission denied
```

```
ubuntu@ip-172-31-17-193:/var/www/html$ sudo chown ubuntu .
```

```
ubuntu@ip-172-31-17-193:/var/www/html$ touch index.html
```

```
ubuntu@ip-172-31-17-193:/var/www/html$ vi index.html
```

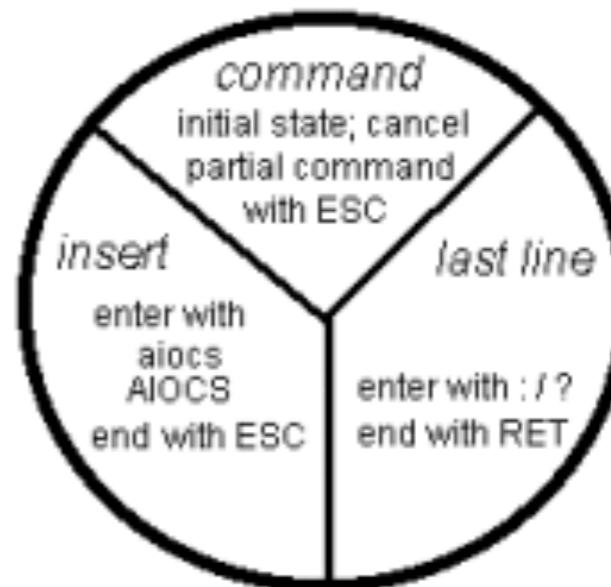
Simple HTML

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<H1>H1 COMP3111</H1>
</html>
```

← → C ec2-54-255-210-1.ap-southeast-1.compute.amazonaws.com

H1 COMP3111

vi states



CHANGE

cw word
cc line
C rest of line
s under cursor
S same as cc
r replace char

k line up
j line down
l right space
h left space
\$ end of line
G end of file
0 beginning of line

DELETE

dw word
dd line
D rest of line
x under cursor
X before cursor
xp transpose

scroll down ^D
word forward w
word backward b
end of word e
line n nG

vi commands

OTHER

u undo change
/ find down
? find up
. repeat
n next

INSERT

a after cursor	yank word yw
A at end of line	yank line yy
i before cursor	put p
I at beginning of line	
o open line below	
O open line above	

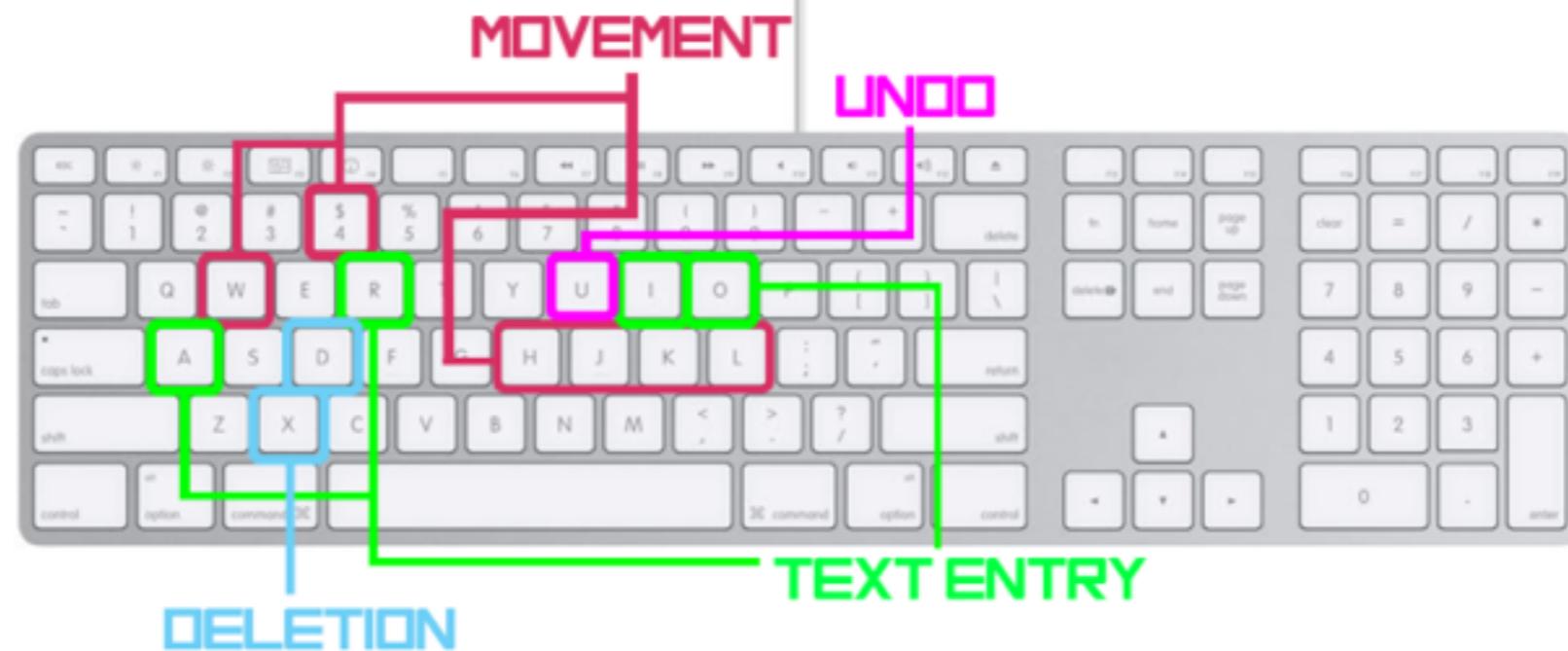
ex COMMANDS

:se nu	set numbers
:se nonu	no numbers
:r file	read in file
:! cmd	run cmd
:se wm=10	wrap words

SAVE/QUIT

:w	write buffer
:q	quit
:wq	write & quit
:ql	abandon buffer
ZZ	same as :wq
^Z	suspend vi

VI CHEAT SHEET



MOVEMENT

j = move cursor down one line
k = move cursor up one line
h = move cursor left one character
l = move cursor right one character

\$ = move cursor to the end of current line
w = move cursor to the beginning of next word

DELETION

x = delete character to the right of cursor
X = delete character to the left of cursor

D = delete to the end of line
dd = delete current line

TEXT ENTRY

i = insert before cursor
o = open a new line after the current
O = open a new line before the current
a = append after the cursor
A = append after the line
r = replace character under cursor

UNDO

u = undo your last action, you can not go back more than one step