
Takeaway and Challenges in Part 1

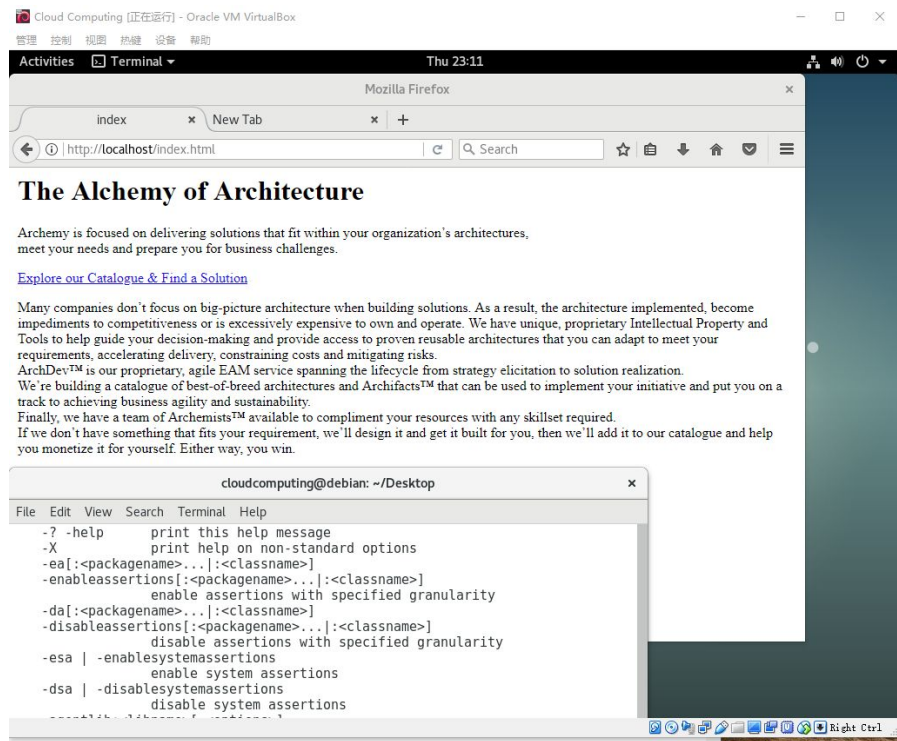
— Cloud Computing Final Project —

Haoran Ma, Chun-Yi Yang, Lizi Chen, Le Wang

Background

In this project, we use the ArchNav application as a complex business cloudification and migration case study.

We first deployed our ArchNav applications without scalability running on our local environment. After confirming everything is going properly, we decided to migrate our application to cloud computing platform.



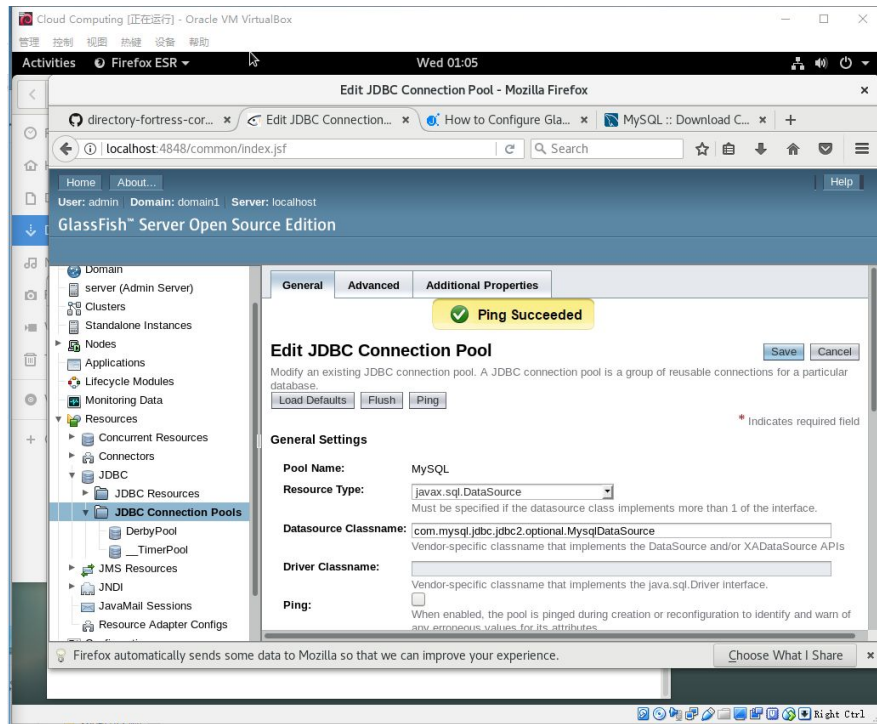
Troubleshooting: MySQL

Challenge #1:

Remote access to MySQL

Challenge #2:

Glassfish cannot work properly with latest MySQL



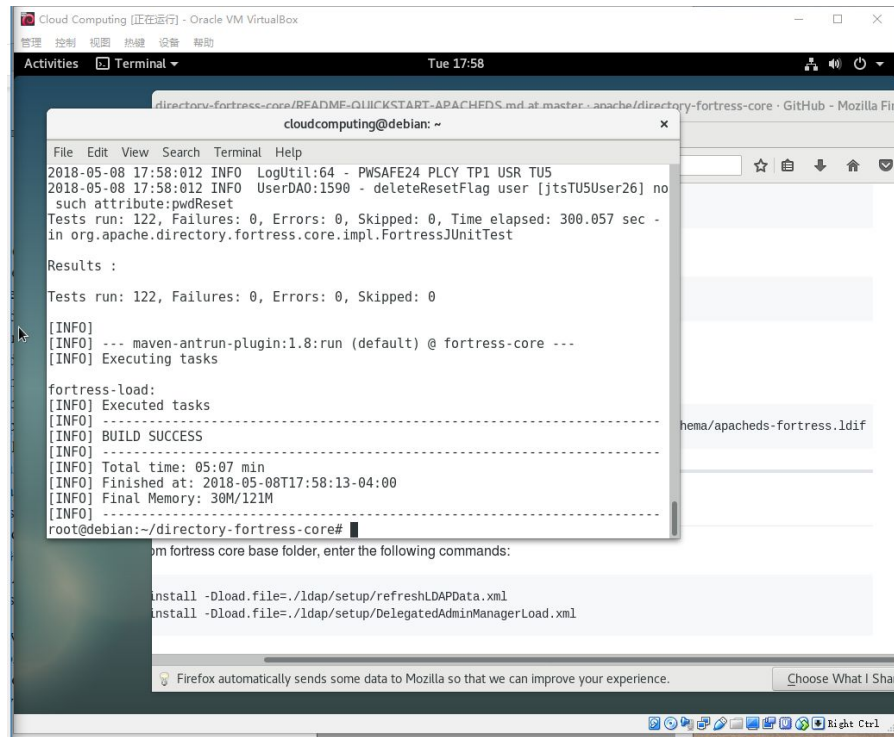
Troubleshooting: Apache

Challenge #1:

The latest version of Apache-fortress-core cannot be deployed on Ubuntu 18

Challenge #2:

Maven 3 needs the latest version of Java (Java 8) while ArchNav needs Java 7



```
Cloud Computing [正在运行] - Oracle VM VirtualBox
Activities Terminal Tue 17:58
directory-fortress-core/README-QUICKSTART-APACHEDS.md at master · apache/directory-fortress-core · GitHub · Mozilla Firefox
cloudcomputing@debian: ~
File Edit View Search Terminal Help
2018-05-08 17:58:012 INFO LogUtil:64 - PWSAFE24 PLCY TP1 USR TU5
2018-05-08 17:58:012 INFO UserDAO:1590 - deleteResetFlag user [jtsTU5User26] no
such attribute:pwdReset
Tests run: 122, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 300.057 sec -
in org.apache.directory.fortress.core.impl.FortressJUnitTest

Results :

Tests run: 122, Failures: 0, Errors: 0, Skipped: 0

[INFO]
[INFO] --- maven-antrun-plugin:1.8:run (default) @ fortress-core ---
[INFO] Executing tasks

fortress-load:
[INFO] Executed tasks
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 05:07 min
[INFO] Finished at: 2018-05-08T17:58:13-04:00
[INFO] Final Memory: 30M/121M
[INFO] -----
root@debian:~/directory-fortress-core#

From fortress core base folder, enter the following commands:

install -Dload.file=./ldap/setup/refreshLDAPData.xml
install -Dload.file=./ldap/setup/DelegatedAdminManagerLoad.xml

Firefox automatically sends some data to Mozilla so that we can improve your experience. Choose What I Share
```

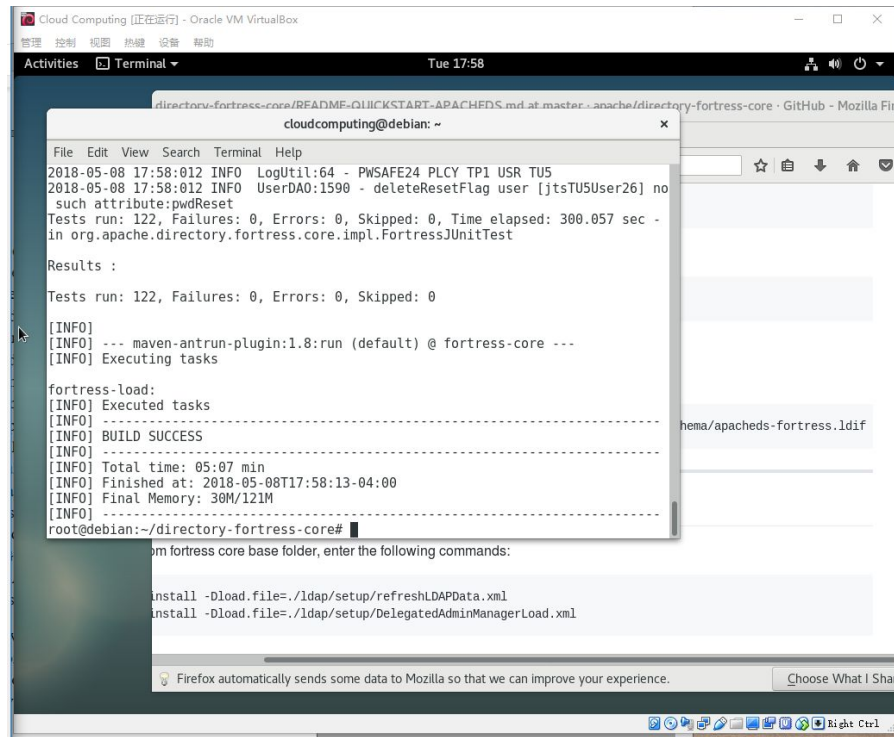
Troubleshooting: Tomcat

Challenge #1:

Tomcat cannot work with default sample security policy download from GitHub

Challenge #2:

There is a fault in Tomcat Instruction Page about shutdown.sh and startup.sh. We should to config init.d and restart the system to load the security policy.



```
Cloud Computing [正在运行] - Oracle VM VirtualBox
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cloudcomputing@debian: ~
File Edit View Search Terminal Help
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[INFO] -----
root@debian:~/directory-fortress-core#
```

Part 2

Personalized Twitter Audio

— Cloud Computing Final Project —

Haoran Ma, Chun-Yi Yang, Lizi Chen, Le Wang

Project Proposal

An Application enables users to listen to feeds from friends and channels they followed on social networks (Twitter).

Application Features

- Transfer tweets to audios
 - Elaborated audio that integrates information from twitter timeline
- Update periodically
 - Regular monitoring and scraping in a specific period
- Classify audio
 - A CNN support method to classify content into different category. Ex. sport, business, etc

Presentation Process

Cloud Architecture Design

- Tools
- Services Introduction

Machine Learning

- CNN learning on text classification
- Model implementation

Application

- Application deployment
- Application showcase

Cloud Service - AWS



Amazon EC2

- Virtual computing environments
- Various configurations of CPU, memory, storage, and networking capacity
- Static IPv4 addresses for dynamic cloud computing



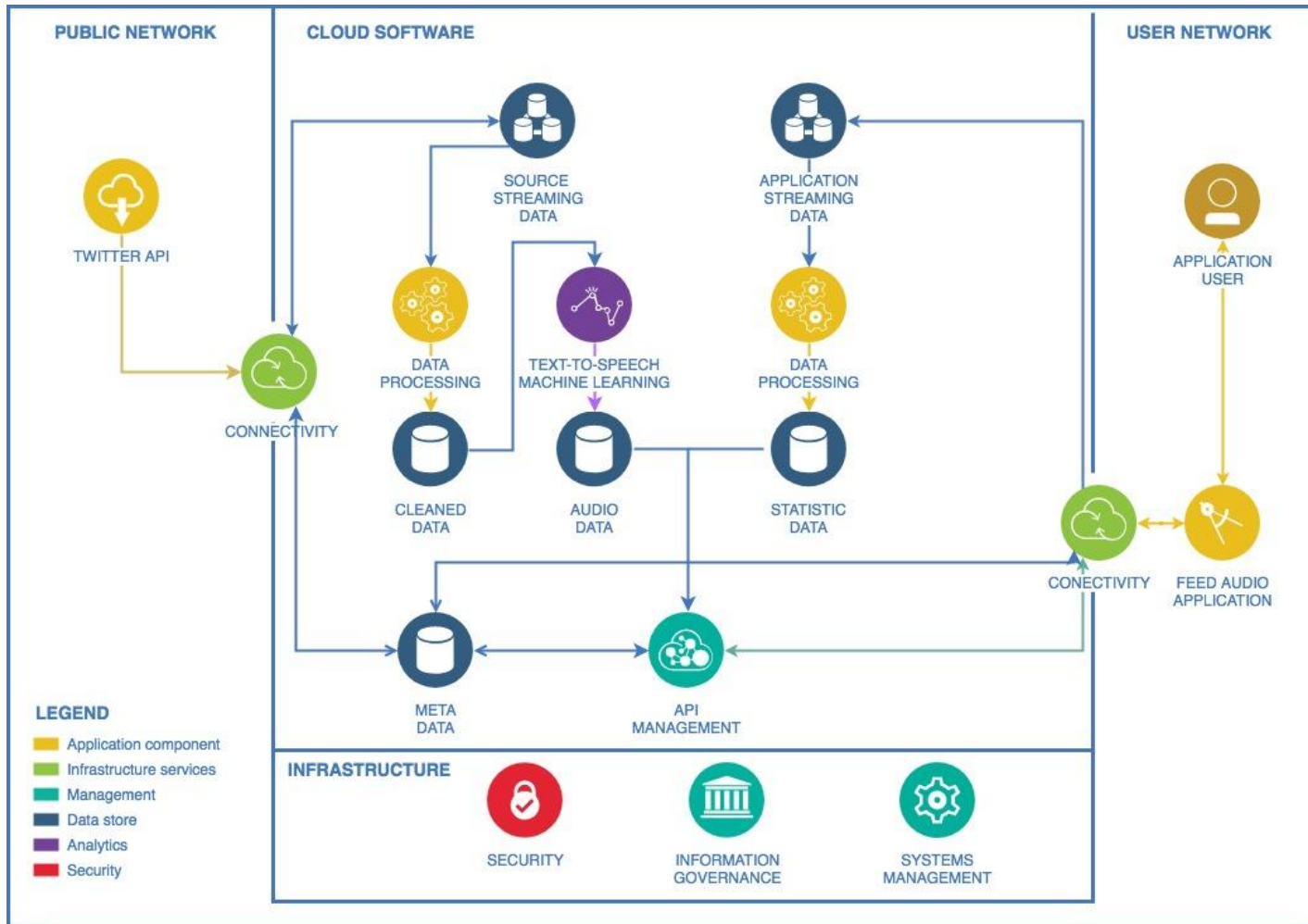
Amazon DynamoDB

- A NoSQL database service,
- Automatic data replication over three zones
- Designed for massive scalability
- DynamoDB delivers highly predictable performance



Amazon S3

- An online storage service
- Durability, availability and scalability
- Comprehensive security and compliance capability
- Flexible management, easy data transfer



EC2

Ubuntu 16.04-amd64-server

t2.micro

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 (IPv4)	IPv4 Pu
	i-0da63a238c6e5bd87	t2.micro	us-east-1c	running	2/2 checks ...	None	ec2-54-90-73-104.com...	54.90.7...

Instance: i-0da63a238c6e5bd87 Public DNS: ec2-54-90-73-104.compute-1.amazonaws.com

DescriptionStatus ChecksMonitoringTags

Instance ID

i-0da63a238c6e5bd87

Instance state

running

Instance type

t2.micro

Elastic IPs

Availability zone

us-east-1c

Security groups

launch-wizard-1 . view inbound rules

Scheduled events

No scheduled events

AMI ID

ubuntu/images/hvm-ssd/ubuntu-xenial-16.04-amd64-server-20180306 (ami-43a15f3e)

Platform

-

IAM role

-

Key pair name

ccProject

EBS-optimized

False

Root device type

ebs

Root device

/dev/sda1

Block devices

/dev/sda1

Elastic GPU

-

Elastic GPU type

-

Elastic GPU status

-

Public DNS (IPv4)

ec2-54-90-73-104.compute-1.amazonaws.com

IPv4 Public IP

54.90.73.104

IPv6 IPs

-

Private DNS

ip-172-31-81-146.ec2.internal

Private IPs

172.31.81.146

Secondary private IPs

VPC ID

vpc-ea4f8a91

Subnet ID

subnet-60743a4f

Network interfaces

eth0

Source/dest. check

True

T2 Unlimited

Disabled

Owner

678663023884

Launch time

April 27, 2018 at 12:31:24 PM UTC-4 (326 hours)

Termination protection

False

Lifecycle

normal

Monitoring

basic

Alarm status

None

Kernel ID

-

RAM disk ID

-

Placement group

-

Virtualization

hvm

Dynamodb

Twitter Schema

```
[
  "user_id": "andy",
  "datetime": "051002" // MONTH/DAY/HOUR
  "tweets": [
    {
      "category": "0",
      "created_at": "Thu May 10 02:45:02 +0000 2018",
      "favorite_count": "3",
      "quote_count": "6",
      "reply_count": "2",
      "retweet_count": "10",
      "screenName": "The Wall Street Journal",
      "text": "David Mayman has helped make sci-fi a",
      "tweet_id": "994407939959148546"
    },
    ...
  ] <!--END OF TWEET LIST-->
  ...
] <!--END OF USER LIST-->
]
```

TWTR [Close](#)



Overview

Items

Metrics

Alarms

Capacity

Indexes

Global Tables

Backups

Triggers

[More](#) ▾

Create item

Actions ▾



Scan: [Table] TWTR: user_id, datetime ^

Viewing 1 to 31 items

Scan ▾

[Table] TWTR: user_id, datetime ▾ ^

+ Add filter

Start search

<input type="checkbox"/>	user_id	datetime	tweets
<input checked="" type="checkbox"/>	andy	051002	[{"M": {"cat...
<input type="checkbox"/>	andy	051004	[{"M": {"cat...
<input type="checkbox"/>	andy	051005	[{"M": {"cat...
<input type="checkbox"/>	andy	051014	[{"M": {"cat...
<input type="checkbox"/>	andy	051018	[{"M": {"cat...
<input type="checkbox"/>	andy	051020	[{"M": {"cat...
<input type="checkbox"/>	andy	051021	[{"M": {"cat...
<input type="checkbox"/>	andy	051022	[{"M": {"cat...
<input type="checkbox"/>	andy	051023	[{"M": {"cat...
<input type="checkbox"/>	andy	051100	[{"M": {"cat...
<input type="checkbox"/>	andy	051101	[{"M": {"cat...
<input type="checkbox"/>	andy	051102	[{"M": {"cat...
<input type="checkbox"/>	andy	051103	[{"M": {"cat...

S3

Bucket: cc-project-s3

Folder: user_id / time_category

Amazon S3 > cc-project-s3 / andy

Overview

Upload

Create folder

More

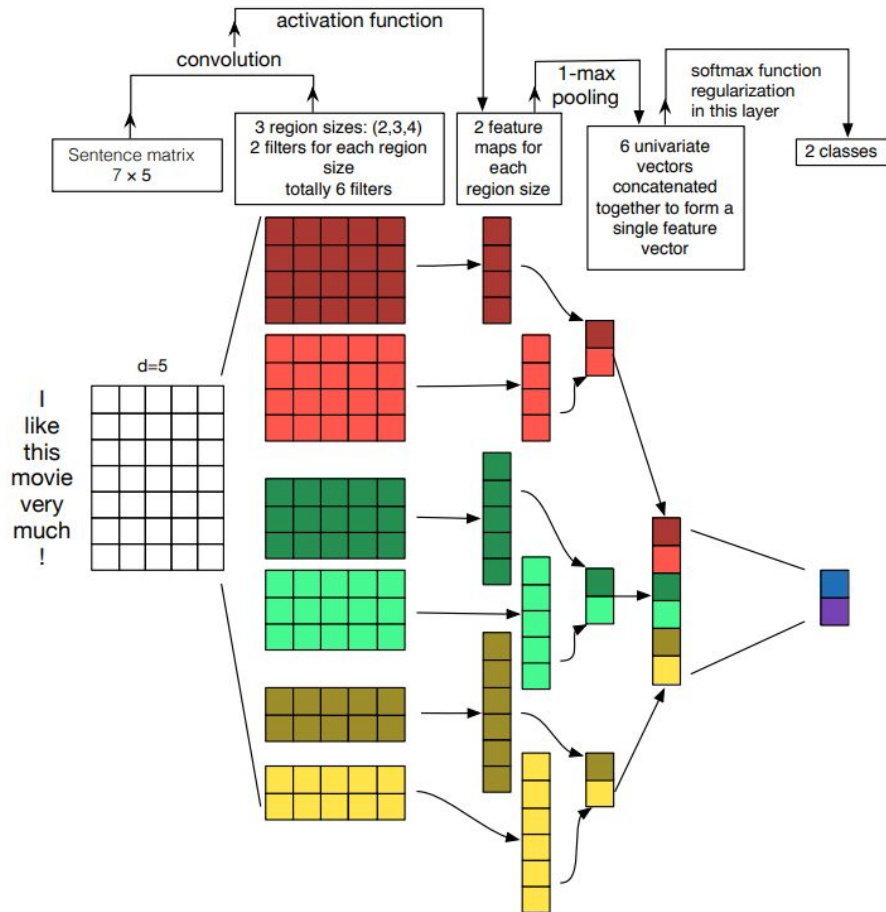
<input type="checkbox"/>	Name	Last modified	Size
<input type="checkbox"/>	0_business.mp3	May 10, 2018 8:00:29 PM GMT-0400	56.7 KB
<input type="checkbox"/>	0_science.mp3	May 10, 2018 8:00:28 PM GMT-0400	373.1 KB
<input type="checkbox"/>	0_summary.mp3	May 10, 2018 8:00:24 PM GMT-0400	843.6 KB
<input type="checkbox"/>	0_world.mp3	May 10, 2018 8:00:33 PM GMT-0400	415.7 KB
<input type="checkbox"/>	12_business.mp3	May 10, 2018 8:27:52 AM GMT-0400	50.9 KB
<input type="checkbox"/>	12_science.mp3	May 10, 2018 8:27:51 AM GMT-0400	126.7 KB
<input type="checkbox"/>	12_summary.mp3	May 10, 2018 8:27:50 AM GMT-0400	680.6 KB
<input type="checkbox"/>	12_world.mp3	May 10, 2018 8:27:58 AM GMT-0400	501.8 KB
<input type="checkbox"/>	14_business.mp3	May 10, 2018 10:10:27 AM GMT-0400	54.3 KB
<input type="checkbox"/>	14_science.mp3	May 10, 2018 10:15:24 AM GMT-0400	281.4 KB
<input type="checkbox"/>	14_sport.mp3	May 10, 2018 10:15:25 AM GMT-0400	84.1 KB
<input type="checkbox"/>	14_summary.mp3	May 10, 2018 10:15:21 AM GMT-0400	819.6 KB



News Classifier

- World
- Sports
- Business
- Sci/Tech
- 300,000 Training set
- 100,000 Testing set
- Precision: 92%
- Recall: 91%

Further Improvement:
Use Tensorflow Serving as a constant running service.



Deployment on AWS EC2

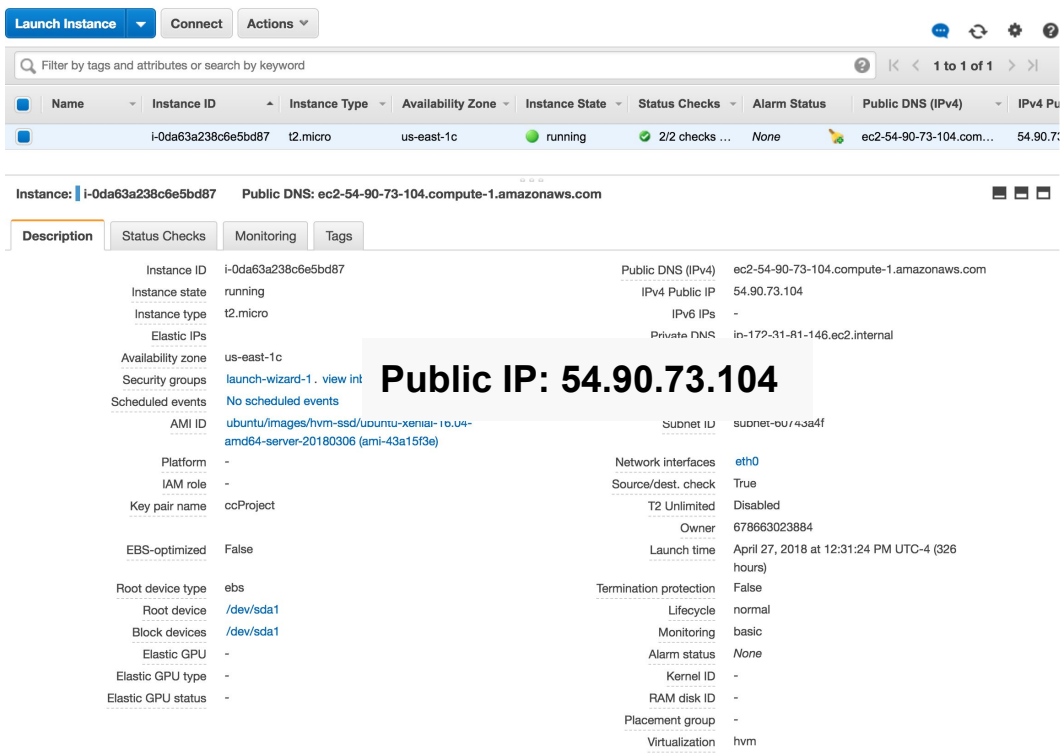
1. Setup EC2 on AWS
2. Connect to EC2

Code sample for flask deployment

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

@app.route('/')
def hello_world():
    return 'Hello, World!'

if __name__ == "__main__":
    app.run(host="0.0.0.0", port=80)
```



The screenshot shows the AWS Management Console for an EC2 instance. The instance is named 'i-0da63a238c6e5bd87' and is in the 'us-east-1c' availability zone. It is a 't2.micro' instance type and is currently in the 'running' state. The public IP address is '54.90.73.104'. The console also shows the instance's status checks, alarm status, and public DNS information. A callout box highlights the public IP address: **Public IP: 54.90.73.104**.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Pu
	i-0da63a238c6e5bd87	t2.micro	us-east-1c	running	2/2 checks ...	None	ec2-54-90-73-104.com...	54.90.7...

Instance: i-0da63a238c6e5bd87 Public DNS: ec2-54-90-73-104.compute-1.amazonaws.com

Description Status Checks Monitoring Tags

Instance ID: i-0da63a238c6e5bd87 Public DNS (IPv4): ec2-54-90-73-104.compute-1.amazonaws.com

Instance state: running IPv4 Public IP: 54.90.73.104

Instance type: t2.micro IPv6 IPs: -

Elastic IPs: - Private DNS: in-172-31-81-146.ec2.internal

Availability zone: us-east-1c

Security groups: launch-wizard-1, view int

Scheduled events: No scheduled events

AMI ID: ubuntu/images/hvm-ssd/ubuntu-xenial-16.04-amd64-server-20180306 (ami-43a15f3e)

Subnet ID: subnet-bu743e4f

Platform: -

IAM role: -

Key pair name: ccProject

Network interfaces: eth0

Source/dest. check: True

T2 Unlimited: Disabled

Owner: 678663023884

Launch time: April 27, 2018 at 12:31:24 PM UTC-4 (326 hours)

EBS-optimized: False

Termination protection: False

Root device type: ebs

Lifecycle: normal

Root device: /dev/sda1

Monitoring: basic

Block devices: /dev/sda1

Elastic GPU: -

Alarm status: None

Elastic GPU type: -

Kernel ID: -

Elastic GPU status: -

RAM disk ID: -

Placement group: -

Virtualization: hvm

Demo