AWS, FLASK, and Deploying Models

W7D2

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Agenda for today

-Overview of Cloud Computing

-AWS

-Flask + Flask-restful

-Deployment with Tmux

Cloud Computing

Advantages:

-Easy Implementation

-Accessible

-No Hardware Required

-Cost per head

-Flexible for growth

-efficient

Disadvantages:

-No longer in control

-bandwidth issues

-downtime (slack 2021)

AWS

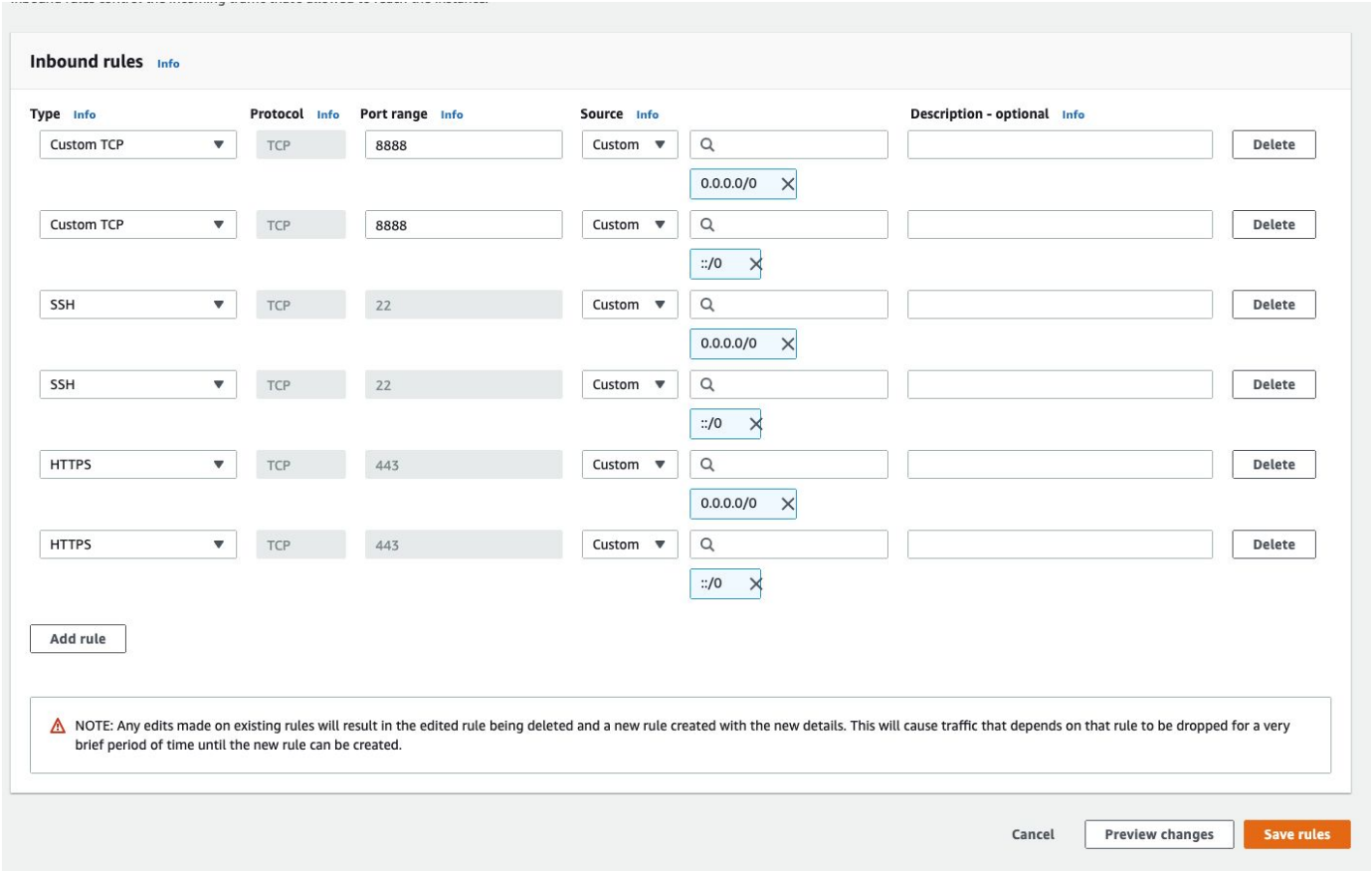
- Top Tier Cloud Computing Service - 31% of market share
- Pay as you Go model
- Netflix, Reddit, Nasa, Quora, Airbnb, Foursquare, and much of the internet is run on AWS
- Tonnes of services
- Accounts for 12% of Amazon’s Revenue, but 57% of Operating Income (Profits)

AWS - Demo

1.) Create an Account
2.) Create a key pair (.pem for MacOSX or Linux, .ppk for WINDOWS)
3.) Create Instance
4.) Edit Security Group (next slide for specific protocols)
5.) WINDOWS SPECIFIC: Install PUTTY (tutorial)(tutorial_video)
    a.) Start PUTTY
    b.) Category Pane - CLICK SESSION
        i.) Host Name = ec2-user@ec2-15-223-49-239.ca-central-1.compute.amazonaws.com
        ii.) Connection Type = SSH
        iii.) Port = 22
    c.) Category PANE - CLICK CONNECTION/SSH/AUTH
        i.) Browse to .ppk file
        ii.) OPEN
6.) Connect to Instance
7.) https://www.anaconda.com/products/individual (Copy the linux download link to get the latest one)
8.) Use wget method to download or curl
9.) *sh Anaconda3-2020.11-Linux-x86_64.sh* (run this command to install)
10.) Exit connection and re-enter connection.
11.) jupyter lab --ip 0.0.0.0 --port 8888 --no-browser

https://repo.anaconda.com/archive/Anaconda3-2021.11-Linux-x86_64.sh

AWS - Security Inbound Rules

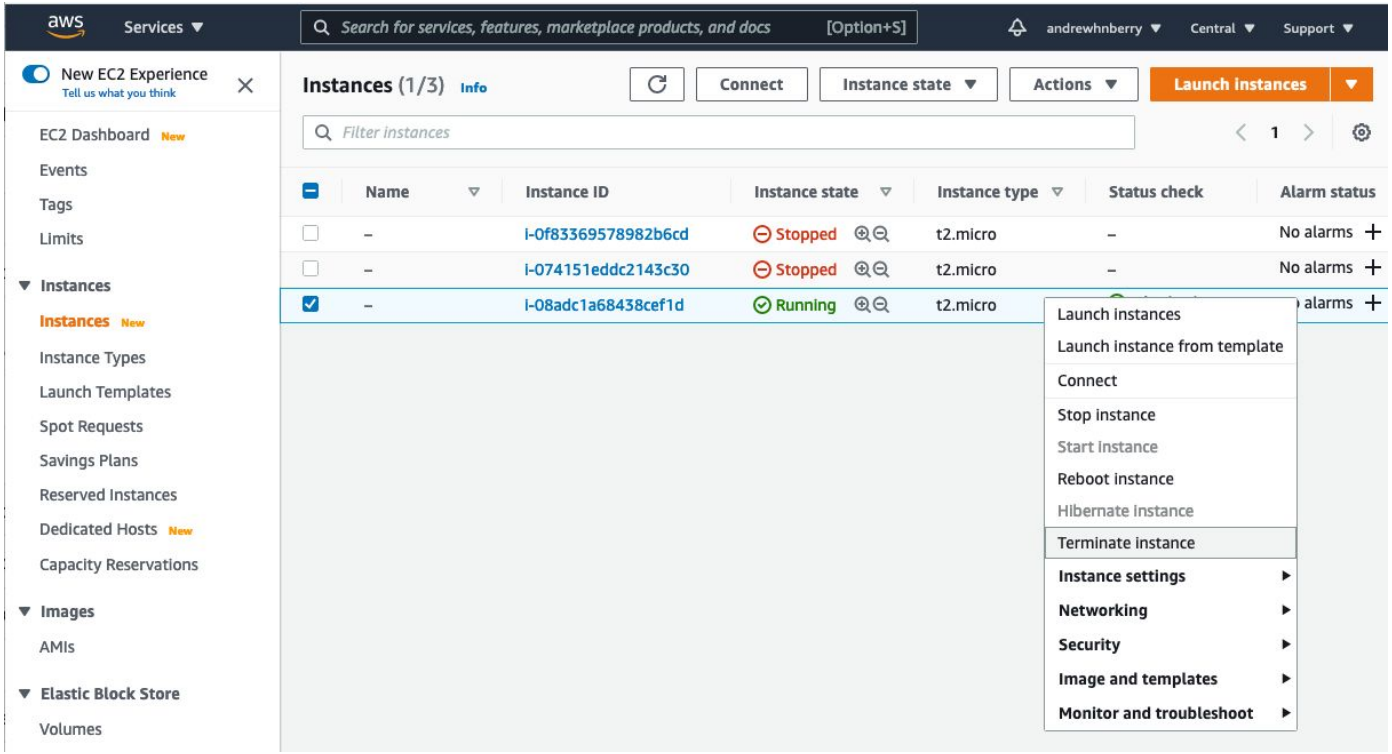


Don’t forget to shut down your instance!

1.) Click Instance

2.) Right click on instance

3.) Select Stop



APIs review

What is an API?

Why do APIs exists?

How does a data scientist use an API?

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What is an API?

Why do APIs exists?

How does a data scientist use an API?

How do we create our own APIs?

RESTFUL API Review

The Anatomy Of A Request

It’s important to know that a request is made up of four things:

1. The endpoint (the URL)
2. The method (verb)
3. The headers (parameters)
4. The data (or body)

1. The endpoint (or route) is the url you request for

root-endpoint/?

https://api.github.com

2. The Method is the type of request you send to the server. You can choose from these types below:

a. GET - Used to get resource from server

b. POST - Used to create new resource on server

c. PUT/PATCH - update resource on server

d. DELETE - delete a resource on the server

with FLASK

- Flask is a web development framework for Python, similar to Django
- However, there we can make APIs with it
- Using Flask restful

Alternatives to Flask-restful for creating APIs: FastAPI, Django REST framework

Setting up a flask development environment:

- Create a new conda environment
- Conda install flask
- Pip install flask-restful

Deploying your model to the cloud - DEMO

- Copy your app.py file and your pickle file to the cloud

For MacOSX and Linux: use scp or CyberDuck

Example: scp -i myAmazonKey.pem /path/to/file username@address:/path/to/destination

https://stackoverflow.com/questions/11388014/using-scp-to-copy-a-file-to-amazon-ec2-instance

For Windows: use winSCP

or…..use nano or vim to write your code in ec2 terminal

Cyberduck tutorial

Secure File Transfer Protocol (SFTP) with Cyberduck (compatible for MacOS and Windows)

1. Install - https://cyberduck.io/download/
2. - On MacOS brew install --cask cyberduck -
3. Cyberduck is free but will promt for donations. To disable the prompt, a registration key can be purchased from the link above or the app can be purchased from the Mac App Store
4. Connect to AWS EC2 Instance with Cyberduck 8.2.1
5. - Open Cyberduck
6. - Open Connection
7. - SFTP (SSH File Transfer Protocol)

Server : <Public IPv4 DNS>,

Port : 22 # Default,

Username : 'ec2-user' or 'ubuntu', # depends on Amazon Machine Image

Password : <blank>,

SSH Private Key : /path/to/key.pem

- Connect Once connected, you can disconnect using the Disconnect button at the top of the window.
Connections are saved in the Bookmarks list

Process adapted from the [tutorial by Jhonny Fransis](https://www.youtube.com/watch?v=hd4oL3WIPVM)

Don't forget!

In your app.py file in your ec2. Don’t forget to add the port and host parameter

If __name__ == ‘__main__’:

    app.run(host = “0.0.0.0”, port = 8888)

Port can be anything that is not in use.

tmux - Command (Essentials) - CHEAT SHEET

$sudo yum install tmux or

$sudo apt install tmux

CRTL + B:

- **% (New Pane)**
- **← or →**
- **“ (Pane Bottom)**
- **exit (to close, pane & windows)**
- **c (new window),**
  - **(switch back CRTL B + 0)**
  - **, (rename)**

- CRTL+B & d (Detach Session)
- tmux ls (LIST ALL SESSIONS)
- tmux attach -t NAME
- tmux rename-session -t old_name new_name
- Tmux new -s new_name
- Tmux kill-session -t session_name

How to save your custom transformers in your pipeline to load later?

- One caveat of the pipelining in scikit-learn is that you can’t save your custom transformers in your pipeline to a pickle file. You will have to copy your custom transformers code to the app.py file.
- Unless you use cloudpickle
  - https://github.com/cloudpipe/cloudpickle
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