AWS, FLASK, and Deploying Models

W7D2

Instructor: Andrew Berry

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)

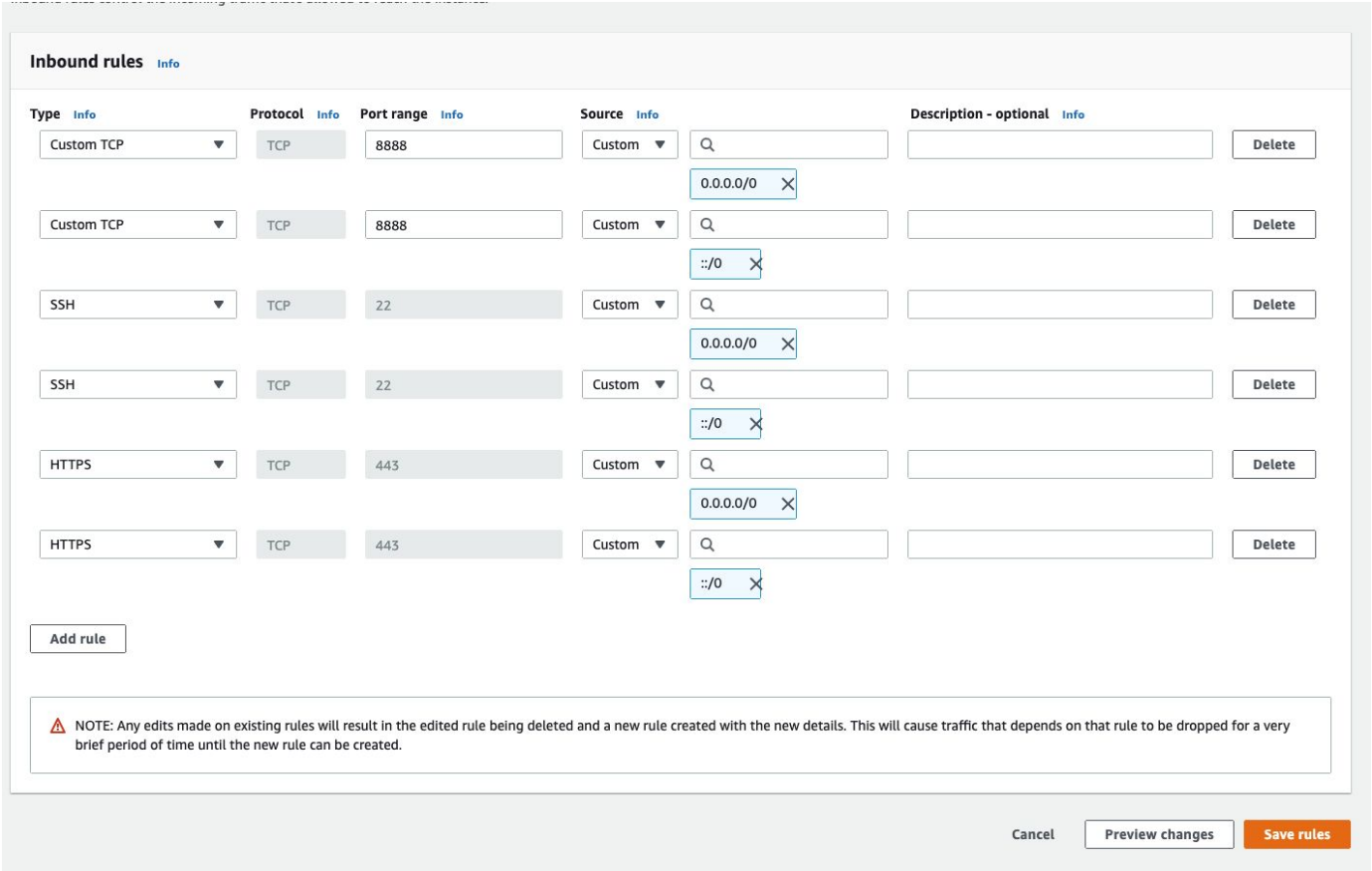
AWS

- 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)
8.) Use wget method to download
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

AWS - Security Inbound Rules

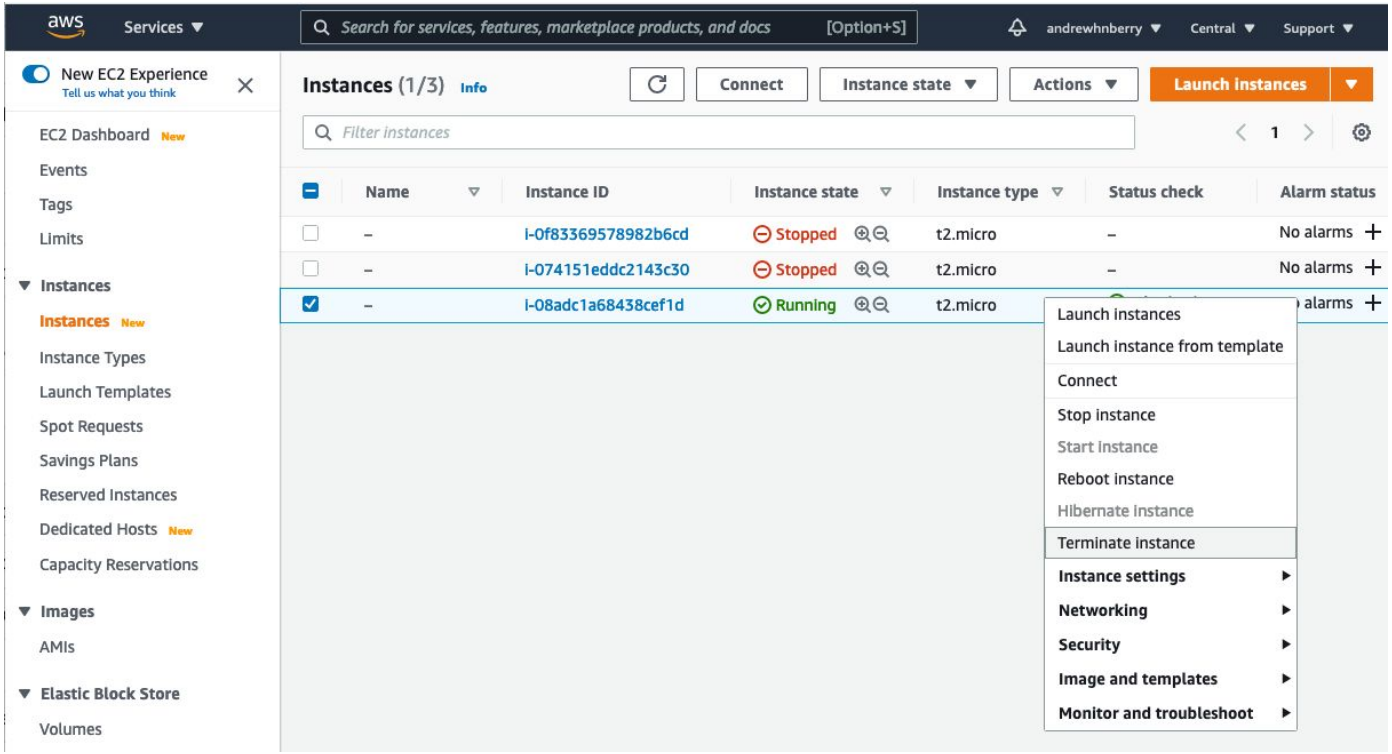


Don’t forget to shut down your instance!

1.) Click Instance

2.) Right click on instance

3.) Select Terminate



APIs review

What is an API?

Why do APIs exists?

How does a data scientist use an API?

APIs review

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

Example: scp /path/to/file username@a:/path/to/destination

For Windows: use winSCP

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

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)

$sudo yum install tmux

CRTL + B:

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

tmux - Command (Essentials)

- 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
-