[Hands-on Session]

Research Reproducibility

Sang-Yun Oh

Department of Statistics and Applied Probability

UC **SANTA BARBARA**

Objectives

- Create a VM instance on Google Cloud

- Install Docker

- Launch Jupyter Lab

- Review steps and potential variations

UC **SANTA BARBARA**
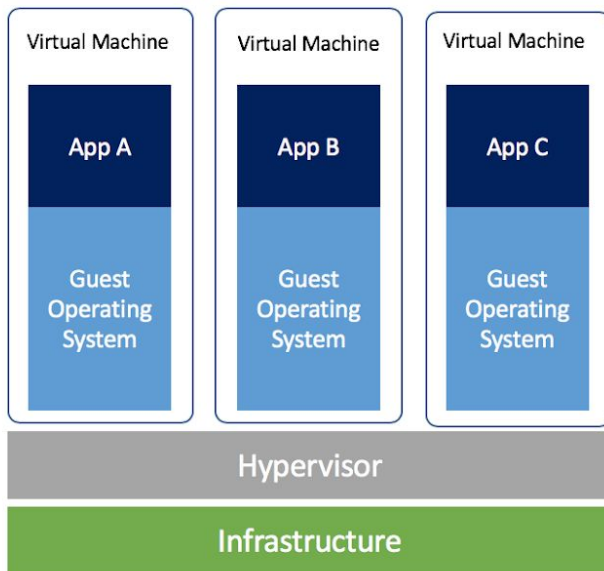
Docker Hub

- Container image registry: https://hub.docker.com/search

- Jupyter Lab/Notebook images: https://hub.docker.com/u/jupyter

- Variations are explained here:
  https://jupyter-docker-stacks.readthedocs.io/en/latest/using/selecting.html

- We will use this: https://hub.docker.com/r/jupyter/scipy-notebook

- Unique image version tag: jupyter/scipy-notebook:dc57157d6316

Creating VM and Installing Docker Demo

Creating a VM on Google Cloud Platform

- Get $50 credit here: https://edu.google.com/programs/students

- Start here: https://console.cloud.google.com

UC **SANTA BARBARA**

Install Docker and Utilities

- After VM starts, connect using SSH

	Name ^	Zone	Recommendation	In use by	Internal IP	External IP	Connect
☐	Filter VM instances						Columns ▼
☐ ✅	instance-1	us-west1-b			10.138.0.2 (nic0)	34.82.44.223	SSH ▼ ⋮

- Install Docker, Docker-compose, and git:

```
sudo apt-get update && \
sudo apt-get install git docker.io docker-compose && \
sudo usermod -aG docker $USER
```

- Exit and reconnect using SSH

- Test Docker installation:

```
docker pull hello-world && docker run hello-world
```

Start Jupyter Docker Image Demo

Start Jupyter Docker Image

- Clone git repository:
```
git clone https://github.com/dddlab/reproducibility-demo && \
Cd reproducibility-demo && ls
```

- Install wget and run setup.sh:
```
sudo apt-get install -y wget && ./setup.sh
```

- Run docker-compose:
```
IMAGE=first-env docker-compose up --build
```

UC **SANTA BARBARA**

Setup Firewall Rules (Google Cloud Console)

- Name: jupyterlab (or some other name)

- Targets: All instances in the network

- Source IP ranges: 0.0.0.0/0

- Protocols and ports:
  check "tcp" and type "8888, 8889"

Action on match ?
- ⦿ Allow
- ◯ Deny

Targets
All instances in the network ▾ ?

Source filter
IP ranges ▾ ?

Source IP ranges *
0.0.0.0/0 ⊗ for example, 0.0.0.0/0, 192.168.2.0/24 ?

Second source filter
None ▾ ?

Protocols and ports ?
- ◯ Allow all
- ⦿ Specified protocols and ports

☑ tcp :   8888,8889

Connect to your VM instance

- Note the External IP address of your VM:

	Name ∧	Zone	Recommendation	In use by	Internal IP	External IP	Connect	
☐ ✅	instance-1	us-west1-b			10.138.0.2 (nic0)	34.82.44.223	SSH ▾	⋮

- Open a browser and enter as URL (including https): https://[External IP]:8889

- Congratulations!
  You successfully launched Jupyter Lab environment on the Cloud

UC **SANTA BARBARA**