Launch Jupyter to the Cloud

With the power of Terraform and Docker

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- Base in London
- Love Python
- Love Comedy
- Love Beer
- Love Travel

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What is Docker Container?  (a.k.a the cute whale with boxes)

“A container image is a lightweight, stand-alone, executable package of a piece of software that includes everything needed to run it: code, runtime, system tools, system libraries, settings……

software will always run the same, regardless of the environment.”
What is Terraform? (infrastructure as code?)

“Infrastructure as code (IaC) is the process of managing and provisioning computer data centers through machine-readable definition files, rather than physical hardware configuration or interactive configuration tools.”

In cloud computing, which means we can launch an instance by code rather than clicking on the console.
**The mission** - Coursera deep learning assignment: train a CNN model

<table>
<thead>
<tr>
<th>Computing power</th>
<th>Price</th>
<th>Customization</th>
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<tr>
<td>A laptop’s CPU is estimated to spend 7 hrs to train a large neural network.</td>
<td>It cost £200 - 1000 for a Nvidia GPU&lt;br&gt;GCP GPU accelerator: $0.22 - 1.46 USD per GPU per hr&lt;br&gt;N1-standard-4 GCE: $0.04 - 0.19 USD per hr</td>
<td>Coursera robo-grader needs a very specific environment&lt;br&gt; Luckily there’s already a Docker image for the course&lt;br&gt; Just need some customization</td>
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Nvidia GPU?<br>(tensorflow-gpu like Nvidia)

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Action Plan for launching Jupyter to Google Cloud Platform

Task 1
Write Terraform Script
You will also need:
- Terraform installed
- Service account key for Google API
- SSH key setup for your project

Task 2
Write startup script to install driver and Docker
- Put all installation in code
- Pull and run Docker image

Task 3 (Optional)
Build Docker Image
- You want to make build one yourself
- Git clone your repo

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Send the structure and the startup script to the API

Run script when the instance is created, install GPU driver and Docker

Start script also use docker to pull and run the image

Launch an instance with the structure

The Jupyter Notebook with the requirements were set up by the Docker image

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Advantage

Why use Terraform and Docker?

Reproducible:

- Collaboration: You can share it with your friend
- Easily modify for different “mission”

Mistake-proof:

- Everything is code, no “hidden” settings
- Reduce manual error
- Easy to start all over again

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Demo... (do I have enough time?)
Reference
Resources to help you get started

Documentations:
- Terraform: https://www.terraform.io/docs/providers/google/index.html
- GCP GCE: https://cloud.google.com/compute/docs/

My Github repo:
- https://github.com/Cheukting/jupyter-cloud-demo
- https://github.com/Cheukting/GCP-GPU-Jupyter

Other tutorials:
- https://blog.elasticbyte.net/getting-started-with-terraform-and-google-compute-engine/