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Thank you for submitting your proposal

[795E] HANDS-ON KUBERNETES: BUILD A POOR MAN'S JUPYTERHUB

This is a proposal for a A workshop (3 hours).

Proposal details

What is your session about?

Containers are light-weight, isolated environments for packaging, distributing, executing and managing your application along with its dependencies. You can think of containers like Python virtualenvs except its not limited to dependencies that can be installed by pip. Moreover, a container allows you to specify resources required for your application such as memory, CPU and persistent storage etc.

Patterns such as microservices mean that modern applications often comprise of a set of containers that need to run on a set of physical nodes - a cluster. The containers need to find each other and communicate with each other. Moreover, it is useful to be able to allocate resources efficiently to each microservice, scale up and down in the face of changing load, be able to roll-out updates and roll-back in case of issues and finally to be able to deal with failures in nodes without downtime.

Enter container orchestration frameworks e.g. Kubernetes which allows you to do all of the things listed in the previous para in a declarative and reproducible manner. This is achieved by offering a rich vocabulary of abstractions that allow you to reason about services, deployments, replications, scaling etc.

This workshop is aimed at Python programmers who aspire to learn about Kubernetes and take advantage of the efficiency and flexibility it offers. We will use a simple Flask application that allows users to create, edit and save Jupyter notebooks “in the cloud” - you can think of it as a poor man’s JupyterHub to teach the participants about Kubernetes. After this workshop, the participants will be able to:

- 1) Describe containers and container orchestration
- 2) Describe the architecture and components of Kubernetes
- 3) Run a Kubernetes cluster on their notebook
- 4) Deploy and manage services on the cluster
- 5) Write declarative recipes for reproducing the setup universally

Is there anything else we should know about your proposal?

I work for Global Stress Index. We make the Felix app (iOS) that measures and classifies stress for our users and recommend interventions.

We have been using Kubernetes in production from the very beginning 2 years ago when we got our management to buy-in to this technology. Since then, we have been able to react (e.g. scale) to changing workloads (e.g. more streaming) across our services without any major issues.

Along the way, we have been able to learn a bit about containers and Kubernetes. We would love the opportunity to share our knowledge with the community. I am sure we will learn a bit more ourselves.

Can you give us an outline of your proposed session?

First hour: Docker

10m: Introduction and motivation

15m: Installation and hello world

15m: Run through of (pre-built) Flask application

10m: Quiz

10m: Break

Second hour: Kubernetes

10m: Introduction and motivation

15m: Installation and hello world

15m: Deploying our application to Kubernetes using the CLI

10m: Quiz

10m: Break

Third hour:

30m: Testing our application, breaking it and fixing it

30m: Quiz

What are your equipment and other requirements?

We will of course need a projector and a screen for the slides.

We will also need good internet connection so that participants can download and install the latest version of Docker and Kubernetes, push docker images to a repository for installation to a remote cluster.

It will be awesome if the participants can come in with the bleeding edge version of Docker (Community Edition) pre-installed on their notebooks. This version comes with the ability to install Kubernetes which is helpful.

Naturally, if all the participants do not have their personal laptop, we will organise them into pairs.

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- This talk is suitable for new programmers.
 - This talk is suitable for teachers.
 - This talk is suitable for data scientists.
 - You have requested assistance from a mentor.

Update your proposal

