CS-548: Cloud-native Software Architectures

Computer Science Department • University of Crete
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Website: https://www.csd.uoc.gr/~hy548/
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Assignment 4: Extending

1. (20% grade) Provide the YAML that allows you to manage a custom resource of type "Fruit" with Kubernetes. An example instance is the following:

apiVersion: hy548.csd.uoc.gr/v1
kind: Fruit
metadata:
 name: apple
spec:
 origin: Krousonas
 count: 3
 grams: 980

Also, provide the kubectl commands needed to:

- a. Install the custom resource.
- b. Create the above instance.
- c. Return the new instance in YAML format.
- d. Return a list of all available instances.
- 2. (40% grade) The example code for CRDs is available on GitHub (https://github.com/chazapis/hy548). Extend the example so that:
 - a. The executable controller.py runs inside a container. Provide the Dockerfile. Build and upload the new container to Docker Hub.
 - b. Provide greeting-controller.yaml, which will create a Deployment with the container you made. Make sure the necessary permissions are set so the controller can read the "Greeting" CRDs and create the corresponding Deployments with the hello-kubernetes container in all namespaces.

Provide the commands you used to verify that the deployment works correctly.

- 3. (40% grade) The example code for the webhooks is available on GitHub (https://github.com/chazapis/hy548). Extend the example so that:
 - a. The executable controller.py runs inside a container. Provide the Dockerfile. Build and upload the new container to Docker Hub.
 - b. The webhook.yaml should use the new container instead of the proxy with Nginx. Provide the new webhook.yaml.

Provide the commands you used to verify the webhook works correctly.

Notes:

• The assignment is personal.

- All exercises contribute equally to the overall grade (unless individual percentages are defined).
- A day/time will be set for answering questions and giving clarifications.
- Write down your answers in a Markdown-formatted text file in either Greek or English and commit it (along with any other files) in a private GitHub repository before the exercise's deadline. Share the repository with the instructor (username "chazapis").