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This branch is 3 commits ahead of main.

 #5



rtshkmr Add writeup and files for autoscaling task 

 1 minute ago

 History

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Task A3: Advanced Kubernetes Features

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 [GitHub Repository](#)

Deliverables

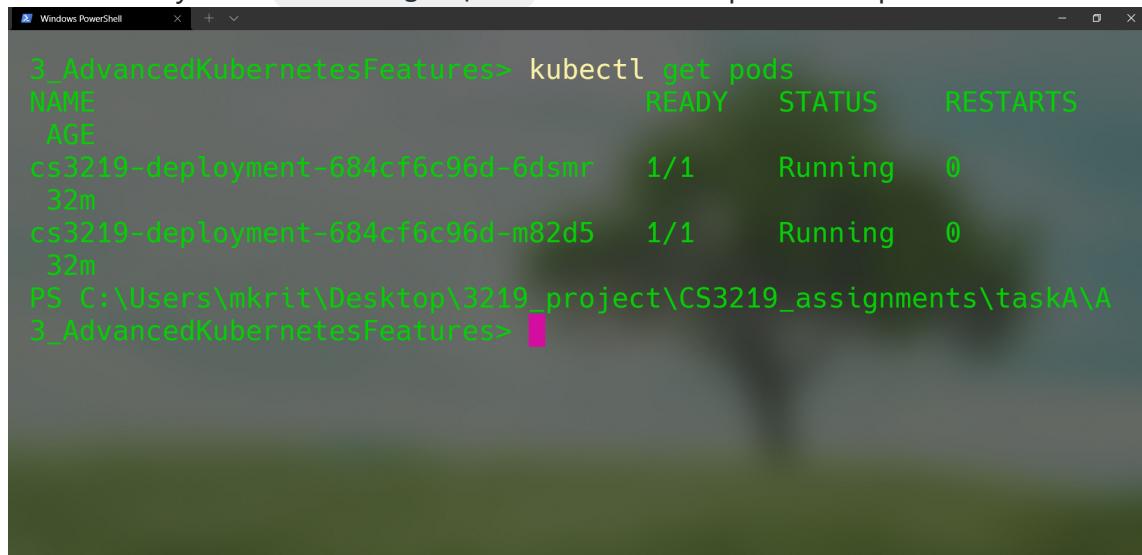
1. nginx ingress, sticky session

Reference for k8s nginx ingress config can be found [here](#)

1. A simple html static page, along with a config file is [here](#)
2. Build the image, then apply the deployment config file found in this sub-project root like so:

```
kubectl apply -f ./nginx-deployment.yaml # apply deployment
```

we can verify via a `kubectl get pods` to see that 2 pods are up:



A screenshot of a Windows PowerShell window titled "Windows PowerShell". The command `kubectl get pods` is run, and the output shows two pods: "cs3219-deployment-684cf6c96d-6dsmr" and "cs3219-deployment-684cf6c96d-m82d5", both in a "Running" state with 1/1 readiness. The PowerShell window has a dark theme.

```
3_AdvancedKubernetesFeatures> kubectl get pods
NAME                               READY   STATUS    RESTARTS
AGE
cs3219-deployment-684cf6c96d-6dsmr   1/1     Running   0
  32m
cs3219-deployment-684cf6c96d-m82d5   1/1     Running   0
  32m
PS C:\Users\mkrit\Desktop\3219_project\CS3219_assignments\taskA\A
3_AdvancedKubernetesFeatures>
```

3. Now, apply the service file followed by the ingress config:

```
kubectl apply -f ./nginx-service.yaml # apply service for internal network
kubectl apply -f https://raw.githubusercontent.com/kubernetes/ingress-nginx
kubectl apply -f ./nginx-ingress.yaml # apply the ingress config
```

This will allow us to locate the static page over at `localhost:32407`

- 4.

Add the example url as host in the appropriate host file. For windows, it's at `C:\Windows\System32\drivers\etc\hosts`. This action needs to be done as sudo. Here's mine after adding:

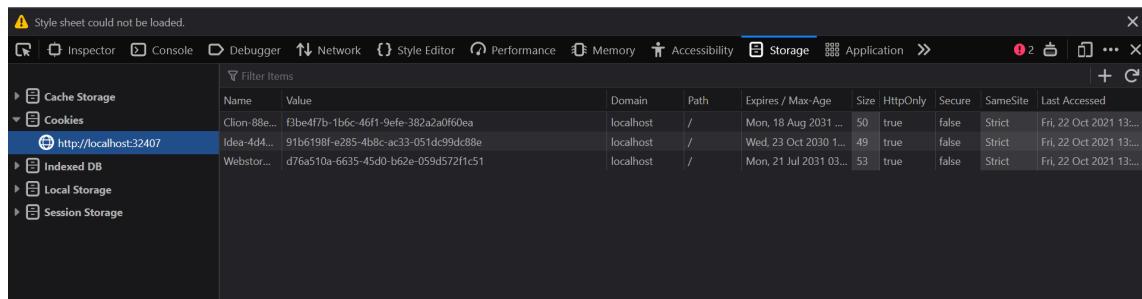
```
# Copyright (c) 1993-2009 Microsoft Corp.  
#  
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.  
#  
# This file contains the mappings of IP addresses to host names. Each  
# entry should be kept on an individual line. The IP address should  
# be placed in the first column followed by the corresponding host name.  
# The IP address and the host name should be separated by at least one  
# space.  
#  
# Additionally, comments (such as these) may be inserted on individual  
# lines or following the machine name denoted by a '#' symbol.  
#  
# For example:  
#  
#      102.54.94.97      rhino.acme.com      # source server  
#      38.25.63.10      x.acme.com          # x client host  
  
# localhost name resolution is handled within DNS itself.  
#      127.0.0.1      localhost  
#      ::1            localhost  
# Added by Docker Desktop  
192.168.2.64 host.docker.internal  
192.168.2.64 gateway.docker.internal  
# To allow the same kube context to work on the host and the container:  
127.0.0.1 kubernetes.docker.internal  
127.0.0.1 example.com  
# End of section
```

5. Via the browser, the existing cookies can be seen to persist, hence are sticky despite refreshes



RITESHHHHhhhhh

This page is run via docker and running reverse proxy via nginx



Name	Value	Domain	Path	Expires / Max-Age	Size	HttpOnly	Secure	SameSite	Last Accessed
Clion-88e...	f3be4f7b-1b6c-46f1-9efe-382a2a0f60ea	localhost	/	Mon, 18 Aug 2031 ...	50	true	false	Strict	Fri, 22 Oct 2021 13...
Idea-4d4...	91b6198f-e285-4b8c-a33-051dc99dc88e	localhost	/	Wed, 23 Oct 2030 1...	49	true	false	Strict	Fri, 22 Oct 2021 13...
Webster...	d76a510a-6635-45d0-b62e-e059d5721c51	localhost	/	Mon, 21 Jul 2031 03...	53	true	false	Strict	Fri, 22 Oct 2021 13...

2. Horizontal Autoscaling

Following the official tutorial, we deploy a php image, then deploy a custom autoscaler declaration and then run a busybox to see it in action.

Run the following commands from within the `/hpd_src` subdir

1. build php image: `docker build -t php-apache -f ./Dockerfile .`
2. apply the php config (i.e. the deployment and service config) `kubectl apply -f ./php-apache.yaml`
3. deploy the metrics server. `kubectl apply -f ./metrics.yaml` # seems like metrics are needed for getting target load metrics It seems that the current load on the pod won't be visible without the metric server (as per [this StackOverflow post](#)).
4. Apply the custom autoscaler: `kubectl apply -f ./hpd-autoscaler.yaml`

```
Windows PowerShell x + ~
esFeatures\hpd_src> kubectl apply -f ./php-apache.yaml
deployment.apps/php-apache unchanged
service/php-apache created
PS C:\Users\mkriti\Desktop\3219_project\CS3219_assignments\taskA\A3_AdvancedKubernetes\esFeatures\hpd_src>
PS C:\Users\mkriti\Desktop\3219_project\CS3219_assignments\taskA\A3_AdvancedKubernetes\esFeatures\hpd_src> kubectl create -f ./hpd-autoscaler.yaml
horizontalpodautoscaler.autoscaling/php-apache-hpd created
PS C:\Users\mkriti\Desktop\3219_project\CS3219_assignments\taskA\A3_AdvancedKubernetes\esFeatures\hpd_src> kubectl create -f ./hpd-autoscaler.yaml
horizontalpodautoscaler.autoscaling/php-apache created
PS C:\Users\mkriti\Desktop\3219_project\CS3219_assignments\taskA\A3_AdvancedKubernetes\esFeatures\hpd_src>
```

For this, I've set the utilization metric to a custom value of 20%.

5. Spin off busybox to simulate stress `kubectl run -i --tty load-generator --rm --image=busybox --restart=Never -- /bin/sh -c "while sleep 0.01; do wget -q -O- http://php-apache; done"`
6. Observe hpa status before, during and after the running of busybox via `kubectl get hpa` Here is a screenshot of what is expected behaviour:

```
q -O- http://php-apache; done
^Z you don't see a command prompt, try pressing enter.
PS C:\Users\mkriti> echo "before busybox"
before busybox
PS C:\Users\mkriti> kubectl get hpa
NAME          REFERENCE          TARGETS   MINPODS   MAXPODS   RE
PLICAS   AGE
php-apache-hpd Deployment/php-apache   8%/20%   1        10      2
PS C:\Users\mkriti> echo "after busybox is spun"
after busybox is spun
PS C:\Users\mkriti> kubectl get hpa
NAME          REFERENCE          TARGETS   PLICAS   MINPODS   MAXPODS   RE
PLICAS   AGE
php-apache-hpd Deployment/php-apache   190%/20%  1        10      2
10m
PS C:\Users\mkriti> kubectl get deployment php-apache
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
php-apache   0/8     0           0           41m
PS C:\Users\mkriti> echo "after stopping busy box"
after stopping busy box
PS C:\Users\mkriti> kubectl get hpa
NAME          REFERENCE          TARGETS   MINPODS   MAXPODS   RE
PLICAS   AGE
php-apache-hpd Deployment/php-apache   8%/20%   1        10      2
20m
PS C:\Users\mkriti> kubectl get deployment php-apache
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
php-apache   10/10    10          10          42m
PS C:\Users\mkriti>
```

primary resources used: [Official K8s Tutorials](#)