

Task A3

Submission Information

| Option | Description |
|---------------------------|---|
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| Matriculation Number | A01840840B |
| Link to GitHub Repository | https://github.com/capeguy/cs3219-otot/OTOT_Task_A3/ |
| Instructions | Below |
| Other Relevant Learnings | null |

Kubectl Commands

Create Ingress

```
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: nginx-ingress
  annotations:
    nginx.ingress.kubernetes.io/affinity: "cookie"
    nginx.ingress.kubernetes.io/session-cookie-name: "route"
    nginx.ingress.kubernetes.io/session-cookie-expires: "172800"
    nginx.ingress.kubernetes.io/session-cookie-max-age: "172800"
spec:
  ingressClassName: nginx
  rules:
  - host: a3.cs3219.com
    http:
      paths:
      - path: /
        pathType: Prefix
        backend:
          service:
            name: nginx-service
            port:
              number: 80
```

```
kubectl apply -f nginx-ingress.yml
```

Use Ingress Controller

`ingressClassName: nginx` is used for the Ingress Controller with configurations for Sticky Session via Cookie

```
capeg@jh:~/cs$ kubectl get ing
NAME          CLASS    HOSTS                                     ADDRESS          PORTS    AGE
nginx-ingress  nginx    a3.cs3219.com,cs3219-a3.capeguy.net     35.213.137.77    80       53m
```

Update host file

```
→ OTOT_Task_D git:(master) x cat /etc/hosts
35.213.137.77 a3.cs3219.com
```

Sending a request and save cookies

```
curl -v --cookie-jar cookie.txt http://a3.cs3219.com
```

```
* OTOT_Task_D git:(master) x curl -v --cookie-jar cookie.txt http://a3.cs3219.com
* Trying 127.0.0.1...
* TCP_NODELAY set
* Connection failed
* connect to 127.0.0.1 port 80 failed: Connection refused
* Trying 35.213.137.77...
* TCP_NODELAY set
* Connected to a3.cs3219.com (35.213.137.77) port 80
> GET / HTTP/1.1
Host: a3.cs3219.com
User-Agent: curl/7.81.2
Accept: */*
Accept-Encoding: gzip, deflate
Cookie:
Expect: 100-continue

<body>
  <h1>Hello! This is the HTML page served from NGINX.</h1>
</body>
* Connection #0 to host a3.cs3219.com left intact
</html>capeg@jh:~/cs$ curl -v --cookie-jar cookie.txt http://a3.cs3219.com
* Trying 35.213.137.77...
* TCP_NODELAY set
* Connected to a3.cs3219.com (35.213.137.77) port 80
> GET / HTTP/1.1
Host: a3.cs3219.com
User-Agent: curl/7.81.2
Accept: */*
Accept-Encoding: gzip, deflate
Cookie:
Expect: 100-continue
```

```
* Connected to a3.cs3219.com (35.213.137.77) port 80 (#0)
> GET / HTTP/1.1
> Host: a3.cs3219.com
> User-Agent: curl/7.64.1
> Accept: */*
>
< HTTP/1.1 200 OK
< Date: Wed, 10 Nov 2021 15:16:12 GMT
< Content-Type: text/html
< Content-Length: 158
< Connection: keep-alive
* Added cookie route="1636557373.595.965.174071" for domain a3.cs3219.com, path /, expire 1636730170
< Set-Cookie: route=1636557373.595.965.174071; Expires=Fri, 12-Nov-21 15:16:12 GMT; Max-Age=172800; Path=/; HttpOnly
< Last-Modified: Sat, 02 Oct 2021 08:58:49 GMT
< ETag: "61581f49-9e"
< Accept-Ranges: bytes
<
<!DOCTYPE html>
<html>

<head>
  <title>CS3219 Task A1</title>
</head>

<body>
  <h1>Hello! This is the HTML page served from NGINX.</h1>
</body>

* Connection #0 to host a3.cs3219.com left intact
</html>* Closing connection 0
OT07_Task_0 git:(master) #
```

```
* Connected to a3.cs3219.com (35.213.137.77) port 80 (#0)
> GET / HTTP/1.1
> Host: a3.cs3219.com
> User-Agent: curl/7.74.0
> Accept: */*
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 200 OK
< Date: Wed, 10 Nov 2021 15:16:34 GMT
< Content-Type: text/html
< Content-Length: 158
< Connection: keep-alive
* Added cookie route="1636557395.667.966.115758" for domain a3.cs3219.com, path /, expire 1636730194
< Set-Cookie: route=1636557395.667.966.115758; Expires=Fri, 12-Nov-21 15:16:34 GMT; Max-Age=172800; Path=/; HttpOnly
< Last-Modified: Sat, 02 Oct 2021 08:58:49 GMT
< ETag: "61581f49-9e"
< Accept-Ranges: bytes
<
<!DOCTYPE html>
<html>

<head>
  <title>CS3219 Task A1</title>
</head>

<body>
  <h1>Hello! This is the HTML page served from NGINX.</h1>
</body>

* Connection #0 to host a3.cs3219.com left intact
</html>* Closing connection 0
capege@jh:~/cs$
```

Note that Response Header includes a "Set-Cookie", and each request is served by a different pod.

Sending a request with previously used cookie

```
curl -v --cookie cookie.txt http://a3.cs3219.com
```

```
capege@jh:~/cs$ curl -v --cookie cookie.txt http://a3.cs3219.com
* Trying 35.213.137.77:80...
* Connected to a3.cs3219.com (35.213.137.77) port 80 (#0)
> GET / HTTP/1.1
> Host: a3.cs3219.com
> User-Agent: curl/7.74.0
> Accept: */*
> Cookie: route=1636557415.851.965.521705
>
* Mark bundle as not supporting multiuse
< HTTP/1.1 200 OK
< Date: Wed, 10 Nov 2021 15:17:17 GMT
< Content-Type: text/html
< Content-Length: 158
< Connection: keep-alive
< Last-Modified: Sat, 02 Oct 2021 08:58:49 GMT
< ETag: "61581f49-9e"
< Accept-Ranges: bytes
<
<!DOCTYPE html>
<html>

<head>
  <title>CS3219 Task A1</title>
</head>

<body>
  <h1>Hello! This is the HTML page served from NGINX.</h1>
</body>
```

Note that Response Header does not include a "Set-Cookie" and is served by the same pod as previously.

Define Horizontal Pod Autoscaler and Prove Scalability

```
kubectl autoscale deployment nginx-deployment --cpu-percent=50 --min=1 --max=10
```

```
kubectl get hpa
```

| NAME | REFERENCE | TARGETS | MINPODS | MAXPODS | REPLICAS | AGE |
|------------------|-----------------------------|---------|---------|---------|----------|-----|
| nginx-deployment | Deployment/nginx-deployment | 15%/50% | 1 | 10 | 1 | 20m |

Induce Load

```
kubectl run -i --tty load-generator --rm --image=busybox --restart=Never -- /bin/sh -c "while sleep 0.01; do wget -q -O- http://cs3219-a3.capeguy.net; done"
```

After some time, see that the number of replicas increases as load increases

Every 0.1s: kubectl get hpa

jh: Wed Nov 10 15:32:53 2021

| NAME | REFERENCE | TARGETS | MINPODS | MAXPODS | REPLICAS | AGE |
|------------------|-----------------------------|----------|---------|---------|----------|-----|
| nginx-deployment | Deployment/nginx-deployment | 232%/50% | 1 | 10 | 4 | 12m |