11.5. LABS



Exercise 11.1: Service Mesh

If you have a large number of services to expose outside of the cluster, or to expose a low-number port on the host node you can deploy an ingress controller. While nginx and GCE have controllers mentioned a lot in Kubernetes.io, there are many to chose from. Even more functionality and metrics come from the use of a service mesh, such as Istio, Linkerd, Contour, Aspen, or several others.

1. We will install linkerd using their own scripts. There is quite a bit of output. Instead of showing all of it the output has been omitted. Look through the output and ensure that everything gets a green check mark. Some steps may take a few minutes to complete. Each command is listed here to make install easier. As well these steps are in the setupLinkerd.txt file.

2. By default the GUI is on available on the localhost. We will need to edit the service and the deployment to allow outside access, in case you are using a cloud provider for the nodes. Edit to remove all characters after equal sign for -enforced-host, which is around line 59.

```
student@cp:~$ kubectl -n linkerd-viz edit deploy web
```

```
L spec:
         containers:
         - args:
           - -linkerd-controller-api-addr=linkerd-controller-api.linkerd.svc.cluster.local:8085
           - -linkerd-metrics-api-addr=metrics-api.linkerd-viz.svc.cluster.local:8085
           - -cluster-domain=cluster.local
           - -grafana-addr=grafana.linkerd-viz.svc.cluster.local:3000
           - -controller-namespace=linkerd
           - -viz-namespace=linkerd-viz
           - -log-level=info
10
11
           - -enforced-host=
                                                               #<-- Remove everything after equal sign
           image: cr.15d.io/linkerd/web:stable-2.11.1
12
           imagePullPolicy: IfNotPresent
13
```

3. Now edit the http nodePort and type to be a NodePort.



student@cp:~\$ kubectl edit svc web -n linkerd-viz

4. Test access using a local browser to your public IP. Your IP will be different than the one shown below.

```
student@cp:~$ curl ifconfig.io

104.197.159.20
```

5. From you local system open a browser and go to the public IP and the high-number nodePort. Be aware the look of the web page may look slightly different as the software is regularly updated, for example Grafana is not longer fully integrated.

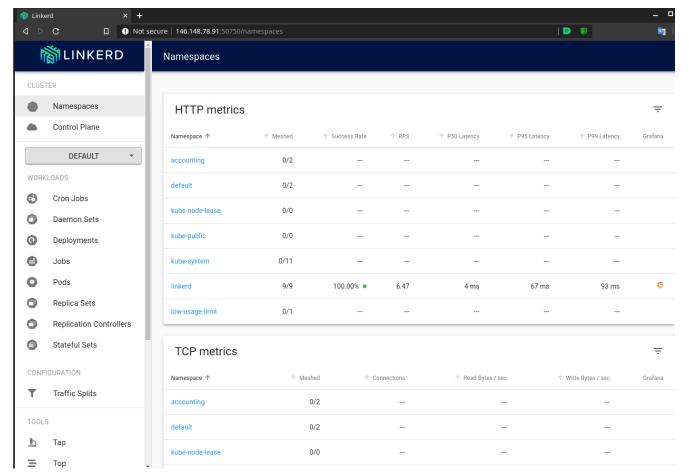


Figure 11.3: Main Linkerd Page



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6. In order for linkerd to pay attention to an object we need to add an annotation. The **linkerd inject** command will do this for us. Generate YAML and pipe it to **linkerd** then pipe again to **kubectl**. Expect an error about how the object was created, but the process will work. The command can run on one line if you omit the back-slash. Recreate the nginx-one deployment we worked with in a previous lab exercise.

```
student@cp:~$ kubectl -n accounting get deploy nginx-one -o yaml | \
    linkerd inject - | kubectl apply -f -

<output_omitted>
```

- 7. Check the GUI, you should see that the accounting namespaces and pods are now meshed, and the name is a link.
- 8. Generate some traffic to the pods, and watch the traffic via the GUI. Use the service-lab service.

student@cp:~\$ kubectl -n accounting get svc

```
NAME
              TYPE
                          CLUSTER-IP
                                            EXTERNAL-IP
                                                          PORT(S)
                                                                          AGE
nginx-one
              ClusterIP
                          10.107.141.227
                                            <none>
                                                           8080/TCP
                                                                          5h15m
service-lab
              NodePort
                          10.102.8.205
                                            <none>
                                                           80:30759/TCP
                                                                          5h14m
```

student@cp:~\$ curl 10.102.8.205

```
<!DOCTYPE html>
<html>
<head>
<title>Welcome to nginx!</title>
<output_omitted>
```

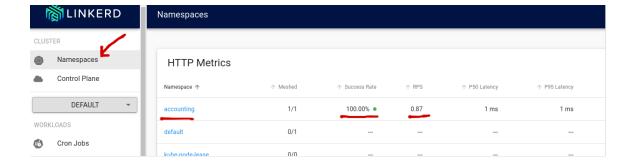


Figure 11.4: Now shows meshed

9. Scale up the nginx-one deployment. Generate traffic to get metrics for all the pods.

```
student@cp:~$ kubectl -n accounting scale deploy nginx-one --replicas=5

deployment.apps/nginx-one scaled
```

```
student@cp:~$ curl 10.102.8.205 #Several times
```

10. Explore some of the other information provided by the GUI. Note that the initial view is of the default namespaces. Change to accounting to see details of the nginx-one deployment.





Figure 11.5: Five meshed pods