

Experiment: Istio on k3d

In this experiment, we will deploy Istio and access on K3d.

Create a cluster without traefik, since there are known issues in k3d with istio and traefik

```
$ k3d cluster create istio-demo --api-port 6660 --agents 2 --k3s-server-arg --no-deploy --k3s-server-arg traefik
```

Generate config

```
$ export KUBECONFIG=$(k3d kubeconfig get istio-demo)
```

Check our pods and services

```
$ kubectl get pod,svc -A
```

NAMESPACE	NAME	READY	STATUS	RESTARTS	AGE
kube-system	pod/local-path-provisioner-58fb86bdfd-h6nnp	1/1	Running	0	13m
kube-system	pod/coredns-57d8bbb86-zkjkq	1/1	Running	0	13m

NAMESPACE	NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
default	service/kubernetes	ClusterIP	10.43.0.1	<none>	443/TCP	13m
kube-system	service/kube-dns	ClusterIP	10.43.0.10	<none>	53/UDP,53/TCP,9153/TCP	13m

Now we're ready for installing Istio on it.

Install Istio

We will use a recent release of 1.6 for Istio to utilize a widely used release version, rather than the newer 1.7 or very new 1.8 versions

We'll download Istio from the releases site: <https://github.com/istio/istio/releases>

For MacOS:

<https://github.com/istio/istio/releases/download/1.6.14/istio-1.6.14-osx.tar.gz> is the target so we'll use

```
$ curl -L https://istio.io/downloadIstio | ISTIO_VERSION=1.6.14 sh -
```

For Windows:

Download and unzip <https://github.com/istio/istio/releases/download/1.6.14/istio-1.6.14-win.zip> Or if you are using Git Bash or Cygwin on windows

```
$ curl -L https://istio.io/downloadIstio | ISTIO_VERSION=1.6.8  
TARGET_ARCH=x86_64 s
```

For additional information on Istio setup we could reference:

<https://istio.io/docs/setup/install/helm/>

We already installed Helm and we'll use the template for Istio

Make sure you're in the folder for the unpacked Istio 1.6.14 or similar which on my computer would be

/Users/geoniece/istio-1.6.14

Create a namespace istio-system for Istio components:

```
$ kubectl create namespace istio-system
```

Install the Istio base chart which contains cluster-wide resources used by the Istiocontrol plane:

```
$ helm install -n istio-system istio-base manifests/charts/base
```

Install the Istio discovery chart which deploys the istiod service:

```
$ helm install --namespace istio-system istiod manifests/charts/istio-control/istio-  
discovery --set global.hub="docker.io/istio" --set global.tag="1.6.14"
```

Install the Istio ingress chart which contains the ingress gateway components:

```
$ helm install --namespace istio-system istio-ingress  
manifests/charts/gateways/istio-ingress --set global.hub="docker.io/istio" --set  
global.tag="1.6.14"
```

Install the Istio egress chart which contains the egress gateway components:

```
$ helm install --namespace istio-system istio-egress  
manifests/charts/gateways/istio-egress --set global.hub="docker.io/istio" --set  
global.tag="1.6.14"
```

Optimistically there will be no errors. Not let's check the deployment.

\$ kubectl get svc,pod -n istio-system

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)
AGE				
service/istio-galley	ClusterIP	10.43.10.191	<none>	443/TCP,15014/TCP,9901/TCP 2m21s
service/istio-policy	ClusterIP	10.43.86.131	<none>	9091/TCP,15004/TCP,15014/TCP 2m21s
service/istio-telemetry	ClusterIP	10.43.11.107	<none>	9091/TCP,15004/TCP,15014/TCP,42422/TCP 2m21s
service/istio-pilot	ClusterIP	10.43.126.19	<none>	15010/TCP,15011/TCP,8080/TCP,15014/TCP 2m21s
service/prometheus	ClusterIP	10.43.41.148	<none>	9090/TCP 2m21s
service/istio-citadel	ClusterIP	10.43.91.217	<none>	8060/TCP,15014/TCP 2m21s
service/istio-sidecar-injector	ClusterIP	10.43.117.133	<none>	443/TCP,15014/TCP 2m21s
service/istio-ingressgateway	LoadBalancer	10.43.69.0	192.168.96.2	15020:30845/TCP,80:31380/TCP,443:31390/TCP,31400:31400/TCP,15029:31842/TCP,15030:32247/TCP,15031:32685/TCP,15032:31093/TCP,15443:30499/TCP 2m21s

NAME	READY	STATUS	RESTARTS	AGE
pod/istio-init-crd-10-1.3.5-28hj7	0/1	Completed	0	5m40s
pod/istio-init-crd-11-1.3.5-vmwmw	0/1	Completed	0	5m40s
pod/istio-init-crd-12-1.3.5-84q77	0/1	Completed	0	5m40s
pod/istio-security-post-install-1.3.5-jb66j	0/1	Completed	0	5m40s
pod/svclb-istio-ingressgateway-ww22d	9/9	Running	0	2m21s
pod/istio-citadel-5c67db5cb-hmhvb	1/1	Running	0	2m20s
pod/prometheus-6f74d6f76d-tpjpc	1/1	Running	0	2m20s
pod/istio-policy-66d87c756b-hf4wx	3	Running	0	2m21s
pod/istio-galley-56b9fb859d-7jmsq	1/1	Running	0	2m21s
pod/istio-sidecar-injector-5d65cfc79-lhh6k	1/1	Running	0	2m20s
pod/istio-pilot-64478c6886-9xm7b	2/2	Running	0	2m20s
pod/istio-telemetry-5d4c4bfbbf-g4ccz	2/2	Running	4	2m20s
pod/istio-ingressgateway-7b766b6685-5vwg5	1/1	Running	0	2m21s

Next, we will run a sample application on our Istio configuration on k3d.

Deploy bookinfo sample application

To verify, we will deploy the bookinfo sample application included in Istio. We can reference additional detail at

<https://istio.io/latest/docs/examples/bookinfo/>

Since BookInfo is included in Istio, we'll have that with our installation

Enable automatic sidecar injection

```
$ kubectl label namespace default istio-injection=enabled
```

Deploy apps

```
$ kubectl apply -f samples/bookinfo/platform/kube/bookinfo.yaml
```

Wait for the deployment finished for example using watch

```
$ kubectl get pods -w
```

```
NAME READY STATUS RESTARTS AGE PodInitializing 0
details-v1-78d78fbddf-5db8b 0/2 PodInitializing 0
37s reviews-v1-7bb8ffd9b6-rdgjc 0/2 PodInitializing 0
37s ratings-v1-6c9dbf6b45-p7567 0/2 PodInitializing 0
36s productpage-v1-596598f447-nj6wx 36s reviews-
v3-68964bc4c8-qrhc4 0/2 PodInitializing 0
37s reviews-v2-d7d75fff8-65f4q
0/2 PodInitializing 0 37s
```

Create ingress gateway for bookinfo

```
$ kubectl apply -f samples/bookinfo/networking/bookinfo-gateway.yaml
```

After that, we confirm the external IP of LoadBalancer service:

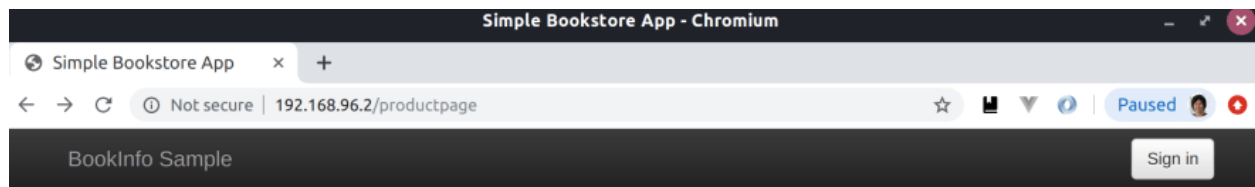
```
$ kubectl get svc -n istio-system istio-ingressgateway -o
jsonpath='{.status.loadBalancer.ingress[0].ip}'
```

192.168.96.2

and opened that IP in following URL with the IP

<http://{The IP Address}/productpage>

We should see the following



The Comedy of Errors

Summary: [Wikipedia Summary](#): The Comedy of Errors is one of **William Shakespeare's** early plays. It is his shortest and one of his most farcical comedies, with a major part of the humour coming from slapstick and mistaken identity, in addition to puns and word play.

Book Details

Type:
paperback
Pages:
200
Publisher:
PublisherA
Language:
English
ISBN-10:
1234567890
ISBN-13:
123-1234567890

Book Reviews

An extremely entertaining play by Shakespeare. The slapstick humour is refreshing!

— Reviewer1



Absolutely fun and entertaining. The play lacks thematic depth when compared to other plays by Shakespeare.

— Reviewer2



The memory usage of the container with bookinfo was around 2GiB:

\$ docker stats --no-stream

CONTAINER ID	NAME	CPU %	MEM USAGE / LIMIT	MEM
598bd6d07c85	k3d-k3s-default-server	52.24%	1.909GiB / 15.4GiB	12.40%
		819MB / 21.7MB	1.41MB / 818MB	899

(Optional) Attach tcpdump to our container network and browse the application to see the communications that are occurring.