



CONTINUOUS ASSESSMENT

LAB 5

CLOUD DATA CENTRES

ZAPPC4202

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YEAR: 4

COURSE: INFORMATION TECHNOLOGY MANAGEMENT

ISSUED YEAR: 2024

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Installation

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2\bin> ls

Directory: C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2\bin

Mode                LastWriteTime         Length Name
----                -
-a----            23/4/2024   1:28 PM      89779712 istiocctl.exe

PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2\bin> .\istiocctl.exe
Istio configuration command line utility for service operators to
debug and diagnose their Istio mesh.

Usage:
  istiocctl [command]

Available Commands:
  admin          Manage control plane (istiod) configuration
  analyze        Analyze Istio configuration and print validation messages
  authz          (authz is experimental. Use `istiocctl experimental authz`)
  bug-report     Cluster information and log capture support tool.
  completion     Generate the autocompletion script for the specified shell
  create-remote-secret Create a secret with credentials to allow Istio to access remote Kubernetes apiservers
  dashboard      Access to Istio web UIs
  experimental   Experimental commands that may be modified or deprecated
  help           Help about any command
  install        Applies an Istio manifest, installing or reconfiguring Istio on a cluster.
  kube-inject    Inject Istio sidecar into Kubernetes pod resources
  manifest       Commands related to Istio manifests
  operator       Commands related to Istio operator controller.
  profile        Commands related to Istio configuration profiles
  proxy-config   Retrieve information about proxy configuration from Envoy [kube only]
  proxy-status   Retrieves the synchronization status of each Envoy in the mesh [kube only]
  remote-clusters Lists the remote clusters each istiod instance is connected to.
  tag            Command group used to interact with revision tags
  uninstall      Uninstall Istio from a cluster
  upgrade        Upgrade Istio control plane in-place
```

```
Windows PowerShell
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2\bin> minikube
W0423 13:52:02.687707 15012 main.go:291] Unable to resolve the current Docker CLI context "default": context "default": context not found: open C:\Users\saeda\.docker\contexts\meta\37a8eec1ce19687d132fe29051dca629d164e2c4958ba141d5f4133a33f0688f\meta.json: The system cannot find the path specified.
minikube provisions and manages local Kubernetes clusters optimized for development workflows.

Basic Commands:
  start           Starts a local Kubernetes cluster
  status          Gets the status of a local Kubernetes cluster
  stop            Stops a running local Kubernetes cluster
  delete          Deletes a local Kubernetes cluster
  dashboard       Access the Kubernetes dashboard running within the minikube cluster
  pause           pause Kubernetes
  unpause         unpause Kubernetes

Images Commands:
  docker-env      Provides instructions to point your terminal's docker-cli to the Docker Engine inside minikube.
                  (Useful for building docker images directly inside minikube)
  podman-env      Configure environment to use minikube's Podman service
  cache           Manage cache for images
  image           Manage images

Configuration and Management Commands:
  addons          Enable or disable a minikube addon
  config          Modify persistent configuration values
  profile         Get or list the current profiles (clusters)
  update-context  Update kubeconfig in case of an IP or port change

Networking and Connectivity Commands:
  service         Returns a URL to connect to a service
  tunnel          Connect to LoadBalancer services

Advanced Commands:
  mount           Mounts the specified directory into minikube
  ssh             Log into the minikube environment (for debugging)
  kubectl         Run a kubectl binary matching the cluster version
  node           Add, remove, or list additional nodes
  cp             Copy the specified file into minikube
```

```

Windows PowerShell
Use "minikube <command> --help" for more information about a given command.
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2\bin> minikube config set cpus 8
W0423 14:23:53.014077 19392 main.go:291] Unable to resolve the current Docker CLI context "default": context "default": context not found: open C:\Users\saeda\docker\contexts\meta\37a8e1ce19687d132fe29051dca629d164e2c4958ba141d5f4133a33f0688f\meta.json: The system cannot find the path specified.
! These changes will take effect upon a minikube delete and then a minikube start
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2\bin> minikube config set memory 3440
W0423 14:24:28.812734 5760 main.go:291] Unable to resolve the current Docker CLI context "default": context "default": context not found: open C:\Users\saeda\docker\contexts\meta\37a8e1ce19687d132fe29051dca629d164e2c4958ba141d5f4133a33f0688f\meta.json: The system cannot find the path specified.
! These changes will take effect upon a minikube delete and then a minikube start
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2\bin> minikube start
W0423 14:24:36.002731 21376 main.go:291] Unable to resolve the current Docker CLI context "default": context "default": context not found: open C:\Users\saeda\docker\contexts\meta\37a8e1ce19687d132fe29051dca629d164e2c4958ba141d5f4133a33f0688f\meta.json: The system cannot find the path specified.
🔴 minikube v1.32.0 on Microsoft Windows 11 Home Single Language 10.0.22631.3296 Build 22631.3296
🔴 minikube 1.33.0 is available! Download it: https://github.com/kubernetes/minikube/releases/tag/v1.33.0
🔴 To disable this notice, run: 'minikube config set WantUpdateNotification false'

🌟 Using the docker driver based on existing profile
🔥 Starting control plane node minikube in cluster minikube
📶 Pulling base image ...
🔄 Restarting existing docker container for "minikube" ...
🔧 Preparing Kubernetes v1.28.3 on Docker 24.0.7 ...
🔧 Configuring bridge CNI (Container Networking Interface) ...
🔧 Verifying Kubernetes components...
  • Using image gcr.io/k8s-minikube/storage-provisioner:v5
  • Using image docker.io/kubernetes/dashboard:v2.7.0
  • Using image docker.io/kubernetes/metrics-scraper:v1.0.8
🔥 Some dashboard features require the metrics-server addon. To enable all features please run:

    minikube addons enable metrics-server

🌟 Enabled addons: storage-provisioner, default-storageclass, dashboard
🔥 Done! kubectll is now configured to use "minikube" cluster and "default" namespace by default
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2\bin> istioctl install --set profile=demo -y
✔ Istio core installed
✔ Istiod installed
✔ Ingress gateways installed
✔ Egress gateways installed
✔ Installation complete
   Made this installation the default for injection and validation.
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2\bin> kubectl label namespace default istio-injection=enabled
namespace/default labeled
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2\bin> kubectl apply -f samples/bookinfo/platform/kube/bookinfo.yaml
error: the path "samples/bookinfo/platform/kube/bookinfo.yaml" does not exist

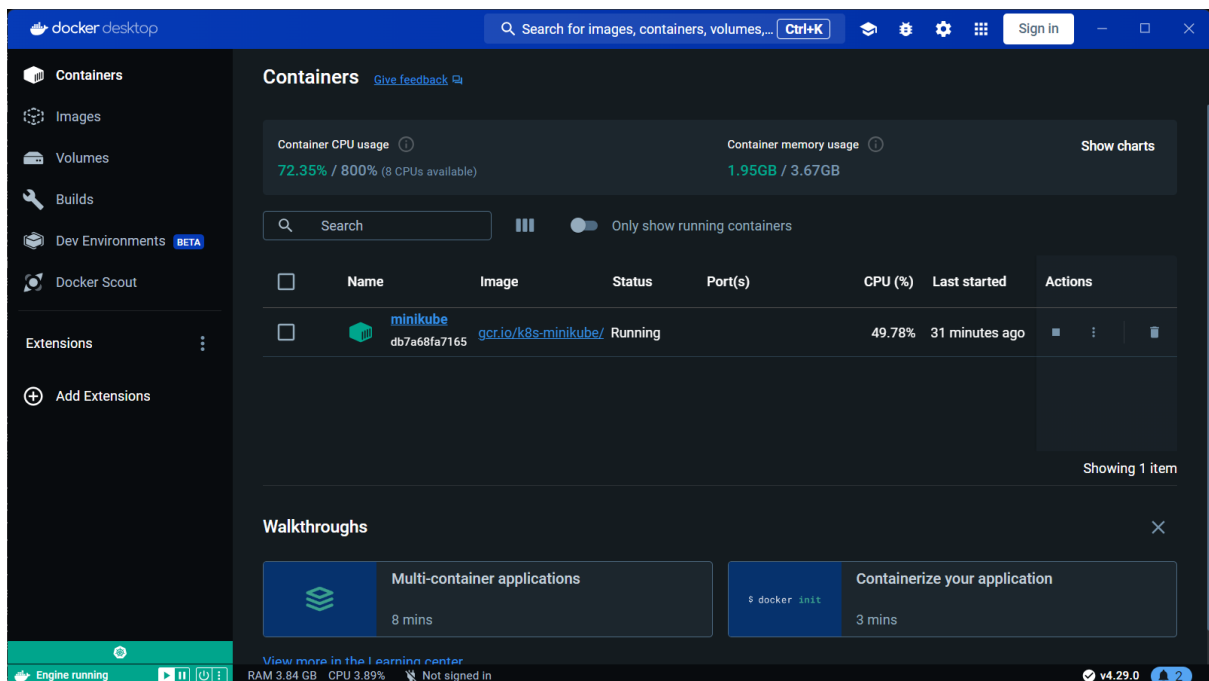
```

Deploy the Sample Application

```
Windows PowerShell
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2\bin> kubectl apply -f samples/bookinfo/platform/kube/bookinfo.yaml
error: the path "samples/bookinfo/platform/kube/bookinfo.yaml" does not exist
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2\bin> C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2
C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2 : The term
'C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2' is not
recognized as the name of a cmdlet, function, script file, or operable
program. Check the spelling of the name, or if a path was included, verify
that the path is correct and try again.
At line:1 char:1
+ C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2
+ ~~~~~
+ CategoryInfo          : ObjectNotFound: (C:\Users\saeda\...64\istio-
1.21.2:String) [], CommandNotFoundException
+ FullyQualifiedErrorId : CommandNotFoundException

PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2\bin> cd C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> kubectl apply -f samples/bookinfo/platform/kube/bookinfo.yaml
service/details created
serviceaccount/bookinfo-details created
deployment.apps/details-v1 created
service/ratings created
serviceaccount/bookinfo-ratings created
deployment.apps/ratings-v1 created
service/reviews created
serviceaccount/bookinfo-reviews created
deployment.apps/reviews-v1 created
deployment.apps/reviews-v2 created
deployment.apps/reviews-v3 created
service/productpage created
serviceaccount/bookinfo-productpage created
deployment.apps/productpage-v1 created
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> kubectl get services
NAME      TYPE        CLUSTER-IP    EXTERNAL-IP    PORT(S)    AGE
details   ClusterIP   10.102.182.176 <none>         9080/TCP    12s
kubernetes ClusterIP   10.96.0.1      <none>         443/TCP    61d
productpage ClusterIP   10.109.167.56  <none>         9080/TCP    10s
ratings   ClusterIP   10.104.253.120 <none>         9080/TCP    12s
reviews   ClusterIP   10.100.62.113  <none>         9080/TCP    11s
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> kubectl get pods
NAME      READY   STATUS    RESTARTS   AGE
details-v1-698d88b-4tw49  0/2     PodInitializing  0          40s
productpage-v1-675fc69cf-q7cp2  0/2     PodInitializing  0          37s
ratings-v1-648d4d9bb-95hcx  0/2     PodInitializing  0          40s
reviews-v1-5b5d6494f4-7npcf  0/2     PodInitializing  0          39s
```

```
Windows PowerShell
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> kubectl get pods
NAME      READY   STATUS    RESTARTS   AGE
details-v1-698d88b-4tw49  2/2     Running    0          8m27s
productpage-v1-675fc69cf-q7cp2  2/2     Running    0          8m24s
ratings-v1-648d4d9bb-95hcx  2/2     Running    0          8m27s
reviews-v1-5b5d6494f4-7npcf  2/2     Running    0          8m26s
reviews-v2-5b5d6494f4-9bwcq  2/2     Running    0          8m25s
reviews-v3-5b5d6494f4-9bwcq  2/2     Running    0          8m25s
```



```

Windows PowerShell
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> minikube start
W0423 14:57:58.088051 3676 main.go:291] Unable to resolve the current Docker CLI context "default": context "default": context not found: open C:\Users\saeda\.docker\contexts\meta\37a8eeclce19687d132fc29b51dca629d164e2c4958ba141d5f4133a33f0688f\meta.json: The system cannot find the path specified.
🔗 minikube v1.32.0 on Microsoft Windows 11 Home Single Language 10.0.22631.3296 Build 22631.3296
🌟 Using the docker driver based on existing profile
🔥 Starting control plane node minikube in cluster minikube
📶 Pulling base image ...
🔄 Updating the running docker "minikube" container ...
! This container is having trouble accessing https://registry.k8s.io
To pull new external images, you may need to configure a proxy: https://minikube.sigs.k8s.io/docs/reference/networking/proxy/
📦 Preparing Kubernetes v1.28.3 on Docker 24.0.7 ...
🔧 Configuring bridge CNI (Container Networking Interface) ...
🔍 Verifying Kubernetes components...
• Using image docker.io/kubernetes/dashboard:v2.7.0
• Using image docker.io/kubernetes/metrics-scraper:v1.0.8
• Using image gcr.io/k8s-minikube/storage-provisioner:v5
🔦 Some dashboard features require the metrics-server addon. To enable all features please run:

    minikube addons enable metrics-server

🌟 Enabled addons: storage-provisioner, default-storageclass, dashboard
👉 Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> kubectl get pod
NAME          READY   STATUS    RESTARTS   AGE
details-v1-698d88b-4tw49    2/2     Running   4          (7m37s ago)   39m
productpage-v1-675fc69cf-q7cp2  2/2     Running   4          (7m37s ago)   39m
ratings-v1-6484c4d9bb-95hcx   2/2     Running   4          (7m37s ago)   39m
reviews-v1-5b5d6494f4-7npcf   2/2     Running   4          (7m19s ago)   39m
reviews-v2-5b667bcbf8-5zfkq   2/2     Running   4          (7m21s ago)   39m
reviews-v3-5b9bd44f4-9bwcs    2/2     Running   4          (7m24s ago)   39m
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> kubectl exec "$(kubectl get pod -l app=ratings -o jsonpath='{.items[0].metadata.name}')" -c ratings -- curl -sS productpage:9080/productpage | findstr "<title>.*</title>"
<title>Simple Bookstore App</title>

```

Open the Application to Outside Traffic

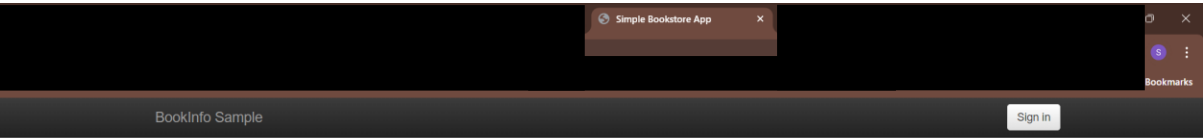
```
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> kubectl apply -f samples/bookinfo/networking/bookinfo-gateway.yaml
gateway.networking.istio.io/bookinfo-gateway created
virtualservice.networking.istio.io/bookinfo created
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> istioctl analyze
✓No validation issues found when analyzing namespace: default.
```

Determining the Ingress IP and Ports

```
Windows PowerShell
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> echo $GATEWAY_URL
127.0.0.1:80
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> $INGRESS_HOST=$(kubectl -n istio-system get service istio-ingressgateway -o jsonpath='{.status.loadBalancer.ingress[0].ip}')
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> echo $INGRESS_HOST
127.0.0.1
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> $INGRESS_PORT="80"
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> $INGRESS_PORT
80
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> $SECURE_INGRESS_PORT="443"
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> echo $SECURE_INGRESS_PORT
443
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> $GATEWAY_URL=($INGRESS_HOST.Trim() + ".") + $INGRESS_PORT
```

Verify External Access

```
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> echo "http://$GATEWAY_URL/productpage"
http://127.0.0.1:80/productpage
```



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
★★★★★

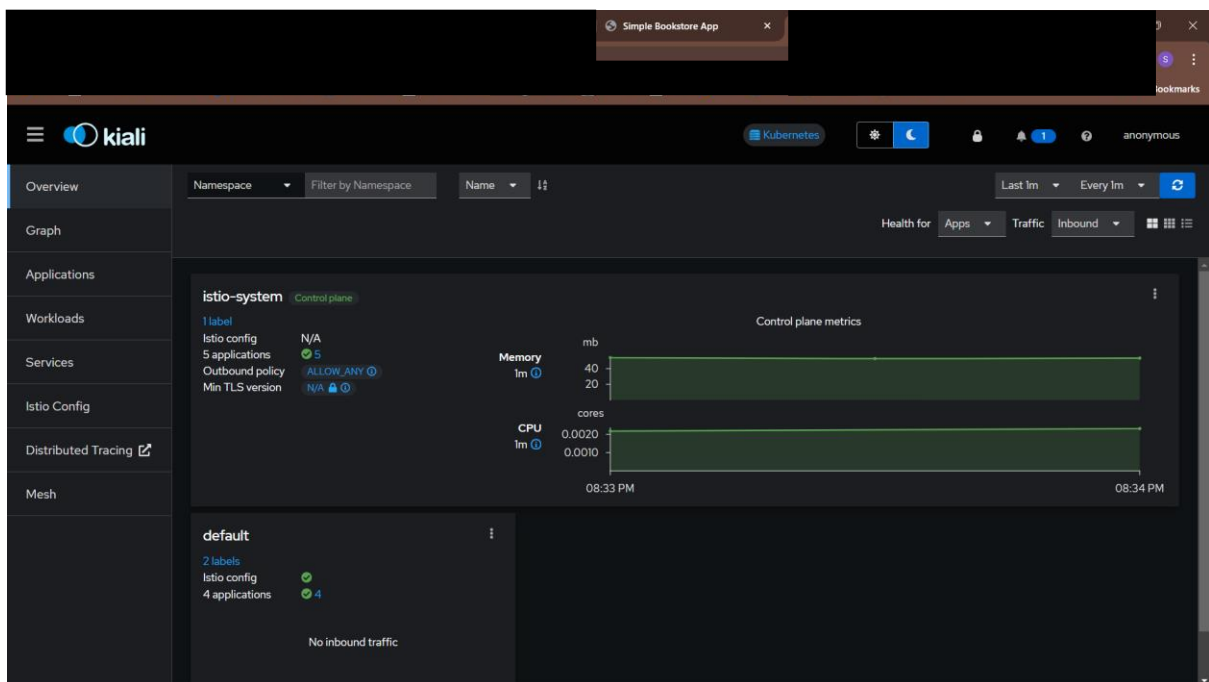
Absolutely fun and entertaining. The play lacks thematic depth when compared to other plays by Shakespeare.

— Reviewer2
★★★★☆

Reviews served by:
[reviews-v3-5b9bd4f4-ily9x](#)

View the Dashboard

```
Windows PowerShell
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> kubectl apply -f samples/addons
serviceaccount/grafana created
configmap/grafana created
service/grafana created
deployment.apps/grafana created
configmap/istio-grafana-dashboards created
configmap/istio-services-grafana-dashboards created
deployment.apps/jaeger created
service/tracing created
service/zipkin created
service/jaeger-collector created
serviceaccount/kiali created
configmap/kiali created
clusterrole.rbac.authorization.k8s.io/kiali-viewer created
clusterrole.rbac.authorization.k8s.io/kiali created
clusterrolebinding.rbac.authorization.k8s.io/kiali created
role.rbac.authorization.k8s.io/kiali-controlplane created
rolebinding.rbac.authorization.k8s.io/kiali-controlplane created
service/kiali created
deployment.apps/kiali created
serviceaccount/loki created
configmap/loki created
configmap/loki-runtime created
service/loki-memberlist created
service/loki-headless created
service/loki created
statefulset.apps/loki created
serviceaccount/prometheus created
configmap/prometheus created
clusterrole.rbac.authorization.k8s.io/prometheus created
clusterrolebinding.rbac.authorization.k8s.io/prometheus created
service/prometheus created
deployment.apps/prometheus created
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> kubectl rollout status deployment/kiali -n istio-system
Waiting for deployment "kiali" rollout to finish: 0 of 1 updated replicas are available...
deployment "kiali" successfully rolled out
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> istioctl dashboard kiali
http://localhost:20001/kiali
PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> for ($i = 1; $i -le 100; $i++) { Invoke-WebRequest -Uri "http://$GATEWAY_URL/productpage" -
-UseBasicParsing | Out-Null}
Invoke-WebRequest : Parameter cannot be processed because the parameter
name 'Us' is ambiguous. Possible matches include: -UseBasicParsing
-UseDefaultCredentials -UserAgent.
At line:1 char:91
```



Kiali

Kubernetes

anonymous

Namespace

Filter by Namespace

Name

istio-system

Control plane

1 label

Istio config N/A

5 applications

Outbound policy ALLOW_ANY

Min TLS version N/A

Control plane metrics

Memory

mb

40

20

CPU

cores

0.0020

0.0010

08:33 PM

08:34 PM

default

2 labels

Istio config

4 applications

No inbound traffic

Error fetching Mesh-wide mTLS status.

Could not fetch namespace list.

Error fetching Istio deployment status.

Windows PowerShell

PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> for i in \$(seq 1 100); do curl -s -o /dev/null "http://\$GATEWAY_URL/productpage"; done

At line:1 char:4

+ for i in \$(seq 1 100); do curl -s -o /dev/null "http://\$GATEWAY_URL/p ...

+ ~

Missing opening '(' after keyword 'for'.

At line:1 char:26

+ for i in \$(seq 1 100); do curl -s -o /dev/null "http://\$GATEWAY_URL/p ...

+ ~

Missing statement body in do loop.

+ CategoryInfo

: ParserError: (:) [], ParentContainsErrorRecordException

+ FullyQualifiedErrorId : MissingOpenParenthesisAfterKeyword

PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> for (\$i = 1

; \$i -le 100; \$i++) { Invoke-WebRequest -Uri "http://\$GATEWAY_URL/productpag

e" -UseBasicParsing | Out-Null}

PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2>

> istioctl da

shboard kiali

http://localhost:20001/kiali

PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> for (\$i = 1

; \$i -le 100; \$i++) { Invoke-WebRequest -Uri "http://\$GATEWAY_URL/productpag

e" -UseBasicParsing | Out-Null}

PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> for (\$i = 1

; \$i -le 100; \$i++) { Invoke-WebRequest -Uri "http://\$GATEWAY_URL/productpag

e" -UseBasicParsing | Out-Null}

PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> for (\$i = 1

; \$i -le 100; \$i++) { Invoke-WebRequest -Uri "http://\$GATEWAY_URL/productpag

e" -UseBasicParsing | Out-Null}

PS C:\Users\saeda\Downloads\istio-1.21.2-win-amd64\istio-1.21.2> for (\$i = 1

CDC Lecture Notes - Google

Istio / Getting Started

how to set variable on comm

Simple Bookstore App

Kiali Console [Kubernetes]

localhost:20001/kiali/console/overview?duration=60&refresh=60000

Apps

RealReal

ID Institute

Computing Degree

Job Salaries

Project Report For...

NEWAI

Calendar

Freja

CDC

Plesk

WordPress

CNCF Landscape

Kubernetes

anonymous

Overview

Graph

Applications

Workloads

Services

Istio Config

Distributed Tracing

Mesh

Namespace

Filter by Namespace

Name

istio-system

Control plane

1 label

Istio config N/A

5 applications

Outbound policy ALLOW_ANY

Min TLS version N/A

Control plane metrics

Memory

mb

50

CPU

cores

0.0020

08:15 PM

08:16 PM

default

2 labels

Istio config

4 applications

No inbound traffic

Health for

Apps

Traffic

Inbound