

# Documenting: Traffic Shifting in Istio

## Setup

Installing the experimental version of the Gateway API CRDs:

```
PS C:\Users\c_bro\Downloads\istio-1.21.2> kubectl kustomize "github.com/kubernetes-sigs/gateway-api/config/crd/experimental?ref=444631bfe06f3bcca5d0eadf1857eac1d369421d" | kubectl apply -f -
customresourcedefinition.apiextensions.k8s.io/gatewayclasses.gateway.networking.k8s.io created
customresourcedefinition.apiextensions.k8s.io/gateways.gateway.networking.k8s.io created
customresourcedefinition.apiextensions.k8s.io/grpcroutes.gateway.networking.k8s.io created
customresourcedefinition.apiextensions.k8s.io/httproutes.gateway.networking.k8s.io created
customresourcedefinition.apiextensions.k8s.io/referencegrants.gateway.networking.k8s.io created
customresourcedefinition.apiextensions.k8s.io/tcproutes.gateway.networking.k8s.io created
customresourcedefinition.apiextensions.k8s.io/tlsroutes.gateway.networking.k8s.io created
customresourcedefinition.apiextensions.k8s.io/udproutes.gateway.networking.k8s.io created
```

Configuring Istio to read the alpha Gateway API resources:

```
PS C:\Users\c_bro\Downloads\istio-1.21.2> istioctl install --set values.pilot.env.PILOT_ENABLE_ALPHA_GATEWAY_API=true --set profile=minimal -y
✓Istio core installed
✓Istiod installed
✓Installation complete
ade this installation the default for injection and validation.
```

## Apply weight-based routing

Routing all traffic to the v1 version:

```
PS C:\Users\c_bro\Downloads\istio-1.21.2> kubectl apply -f samples/bookinfo/gateway-api/route-reviews-v1.yaml
httproute.gateway.networking.k8s.io/reviews created
```

Checking V1 product page:

BookInfo Sample

Sign in

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.

Error fetching product details!

Sorry, product details are currently unavailable for this book.

Error fetching product reviews!

Sorry, product reviews are currently unavailable for this book.

Transferring 50% of the traffic from reviews:v1 to reviews:v3:

```
PS C:\Users\c_bro\Downloads\istio-1.21.2> kubectl apply -f samples/bookinfo/networking/virtual-service-reviews-50-v3.yaml
virtualservice.networking.istio.io/reviews configured
```

Verifying changes:

```
PS C:\Users\c_bro\Downloads\istio-1.21.2> kubectl get virtualservice reviews -o yaml
apiVersion: networking.istio.io/v1beta1
kind: VirtualService
metadata:
  annotations:
    kubectl.kubernetes.io/last-applied-configuration: |
      {"apiVersion":"networking.istio.io/v1alpha3","kind":"VirtualService","metadata":{"annotations":{},"name":"reviews","namespace":"default"},"spec":{"hosts":["reviews"],"http":[{"route":[{"destination":{"host":"reviews","subset":"v1"},"weight":50},{"destination":{"host":"reviews","subset":"v3"},"weight":50}]}]}
  creationTimestamp: "2024-05-07T12:36:19Z"
  generation: 2
  name: reviews
  namespace: default
  resourceVersion: "36665"
  uid: 6863730d-cca7-47de-95e4-2c87e877cf2a
spec:
  hosts:
  - reviews
  http:
  - route:
    - destination:
        host: reviews
        subset: v1
        weight: 50
    - destination:
        host: reviews
        subset: v3
        weight: 50
```

After successful traffic shift, I routed 100% of traffic to version 3:

```
PS C:\Users\c_bro\Downloads\istio-1.21.2> kubectl apply -f samples/bookinfo/networking/virtual-service-reviews-v3.yaml
virtualservice.networking.istio.io/reviews configured
```

In the Istio traffic shifting tutorial, I started by deploying the Bookinfo sample application and applied initial VirtualService configurations to direct all traffic to the v1 versions of each service. I checked that the Bookinfo product page showed no rating stars as

expected due to the v1 version of the reviews service not accessing the ratings service. Next, I modified the traffic routing to distribute traffic between the v1 and v3 versions of the reviews service by applying a new VirtualService configuration that split traffic 50/50 between these two versions. After waiting for the changes, I refreshed the Bookinfo product page multiple times to see that the star ratings appeared red approximately 50% of the time, confirming that traffic was correctly routed to both versions of the reviews service as intended.

# Documenting: Request Routing in Istio

## Routing to version 1

To route to one version only, I configured route rules that send traffic to default versions for the microservices:

```
PS C:\Users\c_bro\Downloads\istio-1.21.2> kubectl apply -f samples/bookinfo/networking/virtual-service-all-v1.yaml
virtualservice.networking.istio.io/productpage unchanged
virtualservice.networking.istio.io/reviews configured
virtualservice.networking.istio.io/ratings unchanged
virtualservice.networking.istio.io/details unchanged
```

```
PS C:\Users\c_bro\Downloads\istio-1.21.2> kubectl get virtualservices -o yaml
apiVersion: v1
items:
- apiVersion: networking.istio.io/v1beta1
  kind: VirtualService
  metadata:
    annotations:
      kubectl.kubernetes.io/last-applied-configuration: |
        {"apiVersion":"networking.istio.io/v1alpha3","kind":"VirtualService","metadata":{"annotations":{},"name":"bookinfo","namespace":"default"},"spec":{"gateways":["bookinfo-gateway"],"hosts":["*"],"http":[{"match":[{"uri":{"exact":"/productpage"}},{"uri":{"prefix":"/static"}},{"uri":{"exact":"/login"}},{"uri":{"exact":"/logout"}},{"uri":{"prefix":"/api/v1/products"}}],"route":[{"destination":{"host":"productpage","port":{"number":9080}}}]}}]}
  creationTimestamp: "2024-05-06T17:05:58Z"
  generation: 1
  name: bookinfo
  namespace: default
  resourceVersion: "22293"
  uid: 3f10a374-6c92-4af8-8a05-8b84e482a658
  spec:
    gateways:
    - bookinfo-gateway
    hosts:
    - '*'
    http:
    - match:
      - uri:
          exact: /productpage
```

I have configured Istio to route to the v1 version of the Bookinfo reviews microservice version 1.

# Testing the new routing configuration:

BookInfo Sample

Sign in

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

Error fetching product reviews!

Type:  
paperback

Pages:  
200

Publisher:  
PublisherA

Language:  
English

ISBN-10:  
1234567890

ISBN-13:  
123-1234567890


Sorry, product reviews are currently unavailable for this book.

## Routing based on user identity

### Routing to v2, the version with product reviews:

```
metadata:
  annotations:
    kubectl.kubernetes.io/last-applied-configuration: |
      {"apiVersion":"networking.istio.io/v1alpha3","kind":"VirtualService","metadata":{"annotations":{},"name":"reviews","namespace":"default"},"spec":{"hosts":["reviews"],"http":[{"match":[{"headers":{"end-user":{"exact":"jason"}}}], "route":[{"destination":{"host":"reviews","subset":"v2"}}]},{"route":[{"destination":{"host":"reviews","subset":"v1"}}]}}}
    creationTimestamp: "2024-05-07T12:36:19Z"
    generation: 5
    name: reviews
    namespace: default
    resourceVersion: "41291"
    uid: 6863730d-cca7-47de-95e4-2c87e877cf2a
spec:
  hosts:
  - reviews
  http:
  - match:
    - headers:
        end-user:
          exact: jason
    route:
    - destination:
        host: reviews
        subset: v2
  - route:
    - destination:
        host: reviews
        subset: v1
PS C:\Users\c_bro\Downloads\istio-1.21.2>
```

Logging in as end user Jason to get access to version 2:

 jason ( [sign out](#) )

a major part of the humour coming from slapstick and mistaken identity, in addition to puns

In this task, I used Istio to send 100% of the traffic to the v1 version of each of the Bookinfo services. I then set a rule to selectively send traffic to version v2 of the reviews service based on a custom end-user header, Jason, added to the request by the productpage service.

# Documenting: Fault Injection in Istio

## Injecting an HTTP delay fault


Creating a fault injection rule to delay traffic coming from the test user Jason:

```
PS C:\Users\c_bro\Downloads\istio-1.21.2> kubectl apply -f samples/bookinfo/networking/virtual-service-ratings-test-delay.yaml
virtualservice.networking.istio.io/ratings configured
```

Confirming the rule was created:

```
spec:
  hosts:
  - ratings
  http:
  - fault:
      delay:
        fixedDelay: 7s
        percentage:
          value: 100
      match:
      - headers:
          end-user:
            exact: jason
        route:
          - destination:
              host: ratings
              subset: v1
      - route:
          - destination:
              host: ratings
              subset: v1
```

## Testing the delay configuration:

 jason ( [sign out](#) )

### nedy of Errors

one of his most farcical comedies, with a major part of the humour coming from slapstick and mistaken identity, in addition to puns

#### Error fetching product reviews!

Sorry, product reviews are currently unavailable for this book.

A problem has occurred, even though 7 seconds has passed reviews are still unavailable