Managing Service Traffic

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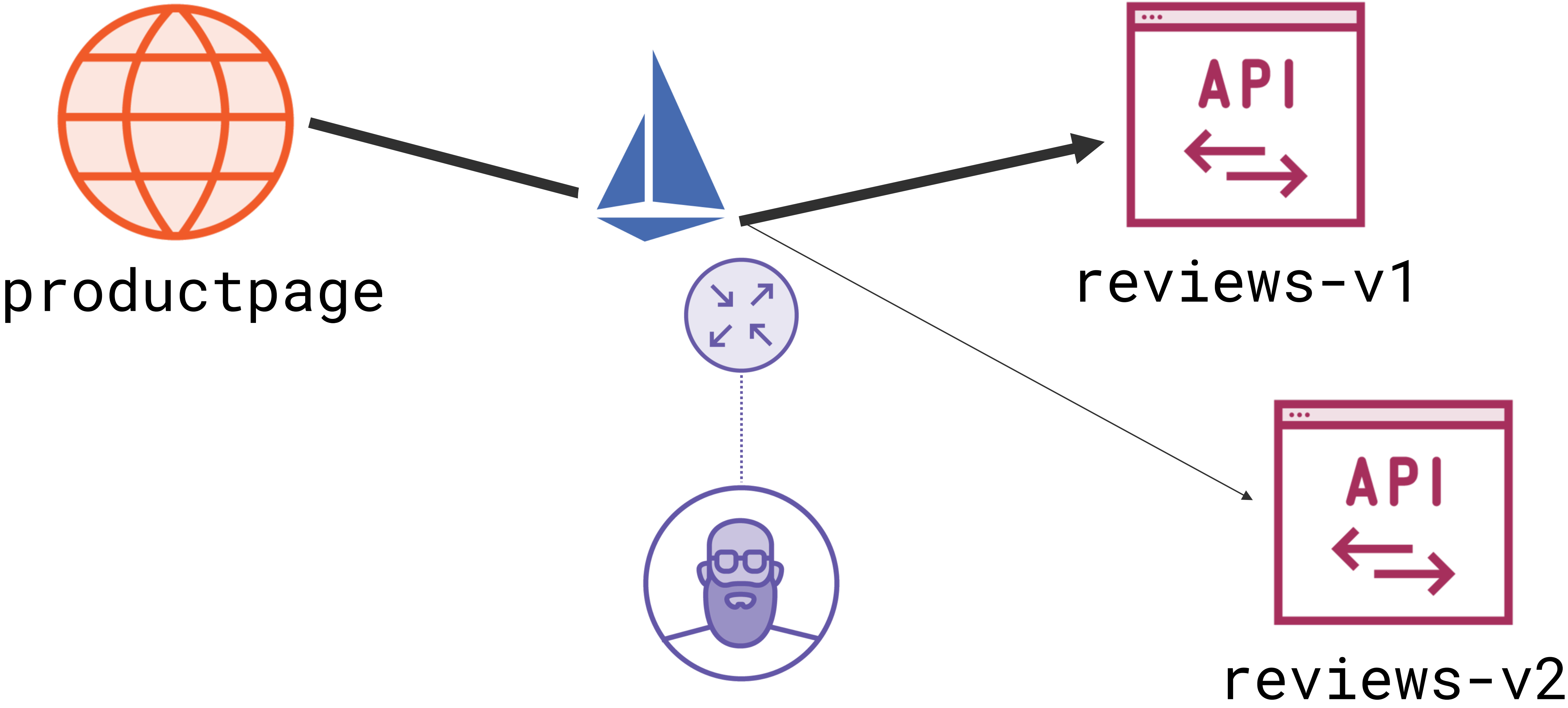
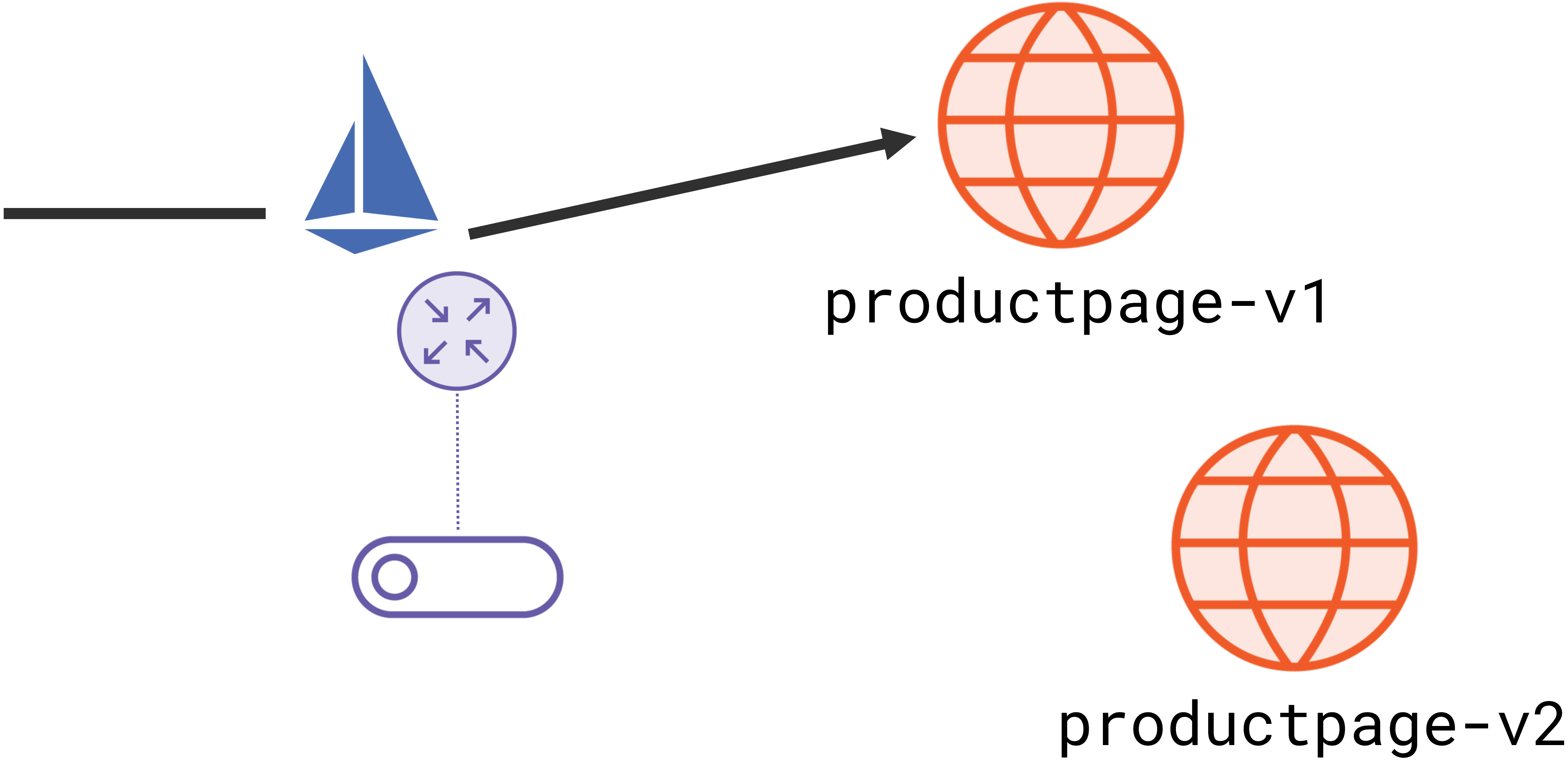
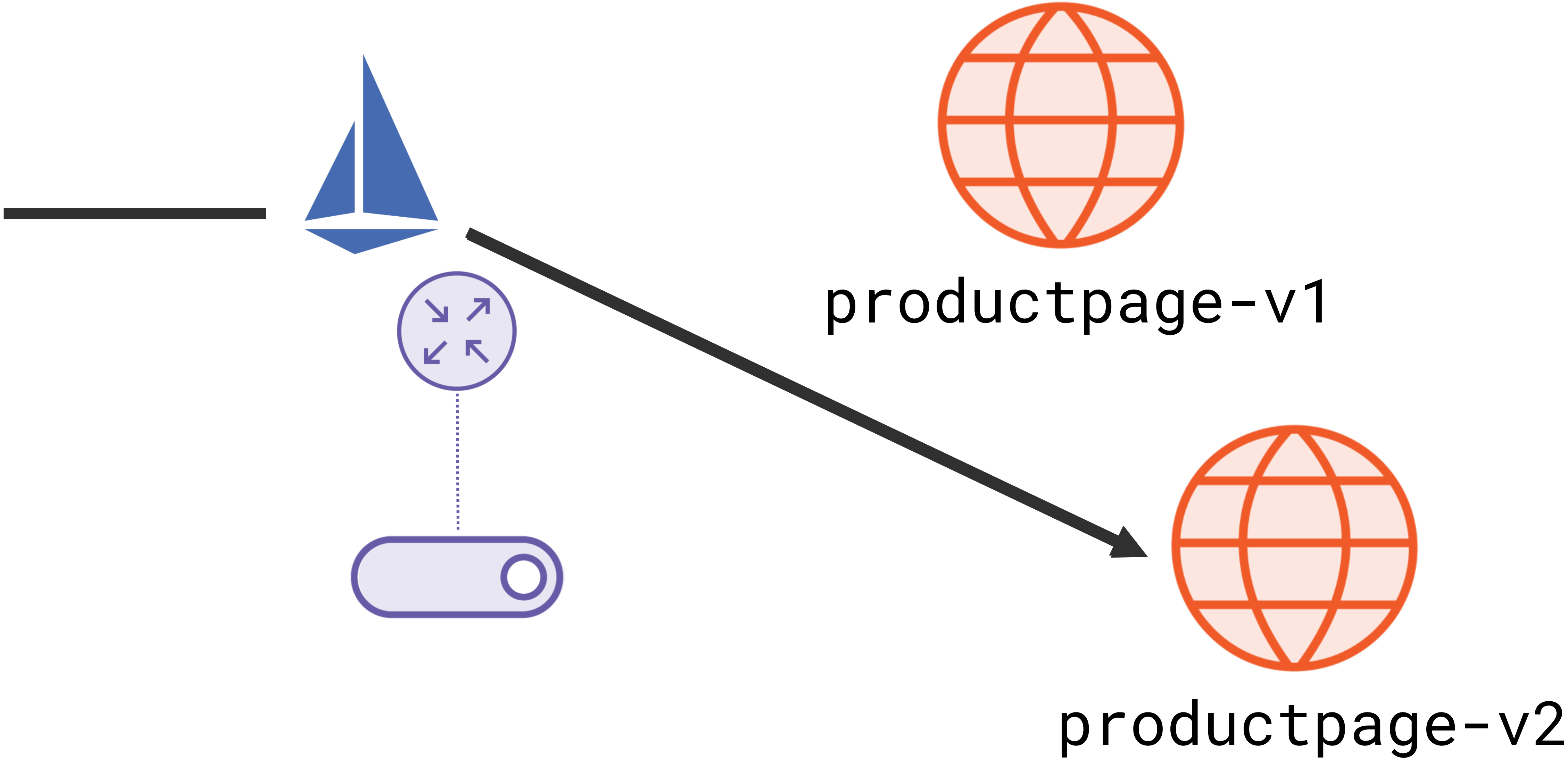

productpage
API
reviews-v1
API
reviews-v2



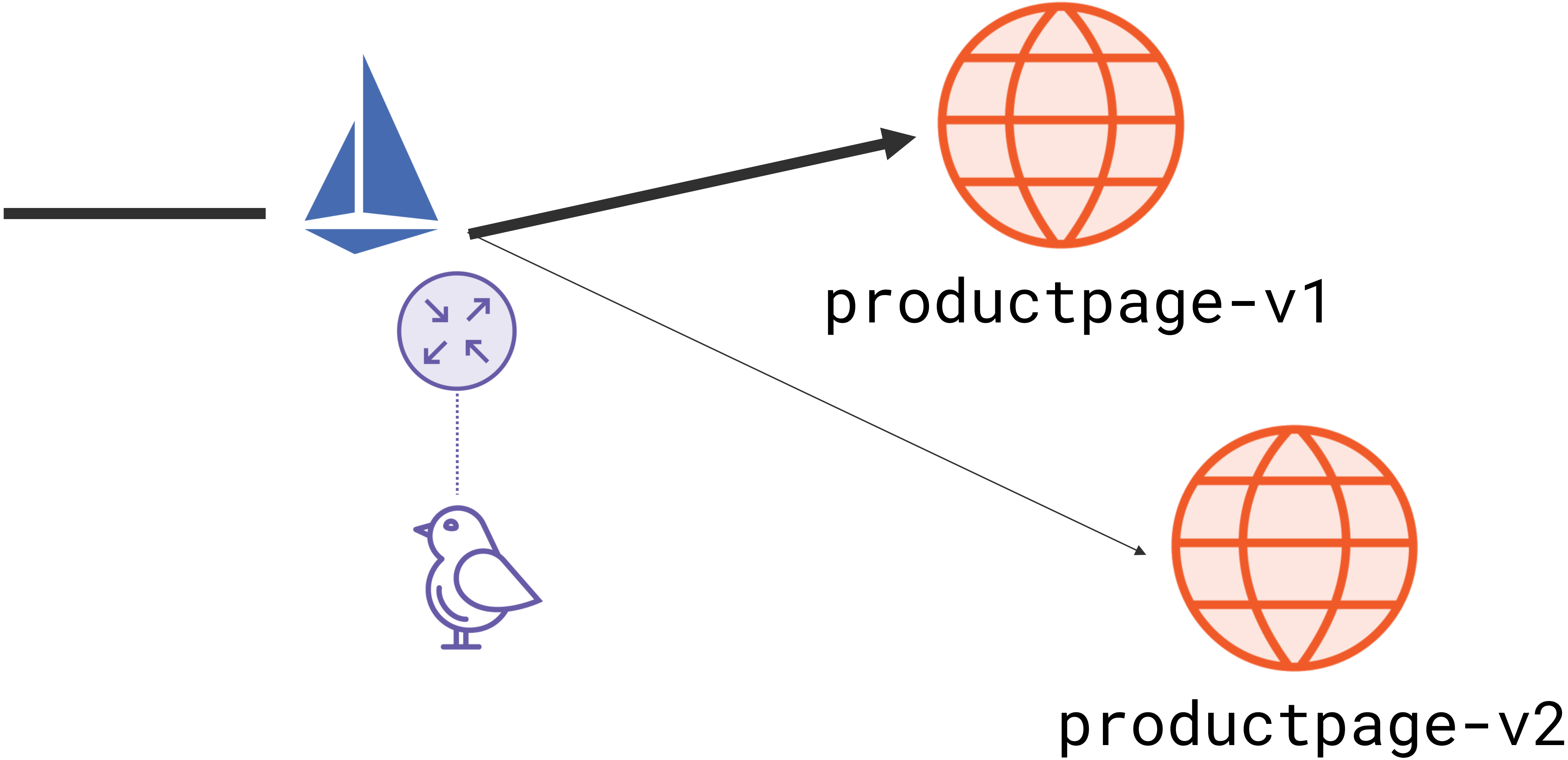
productpage-v1

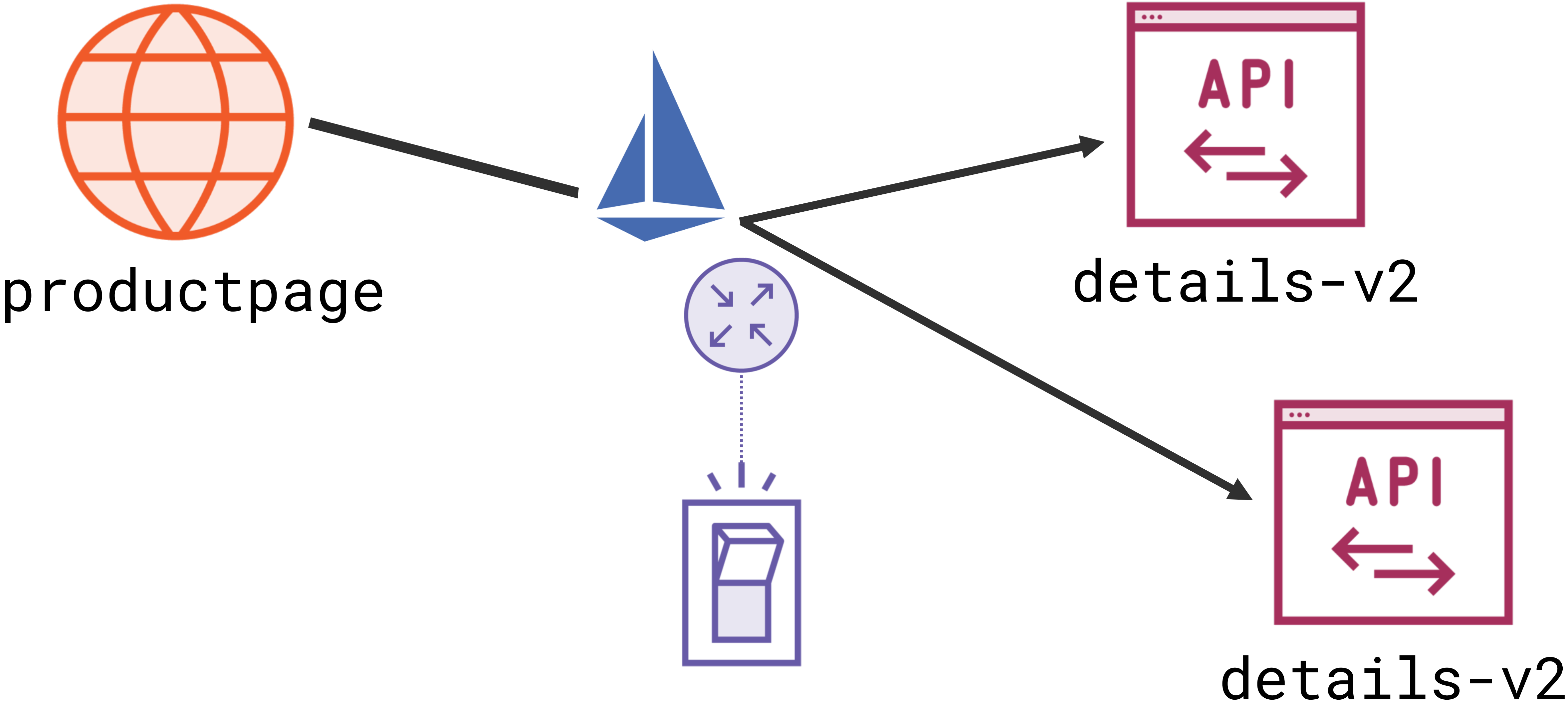
productpage-v2

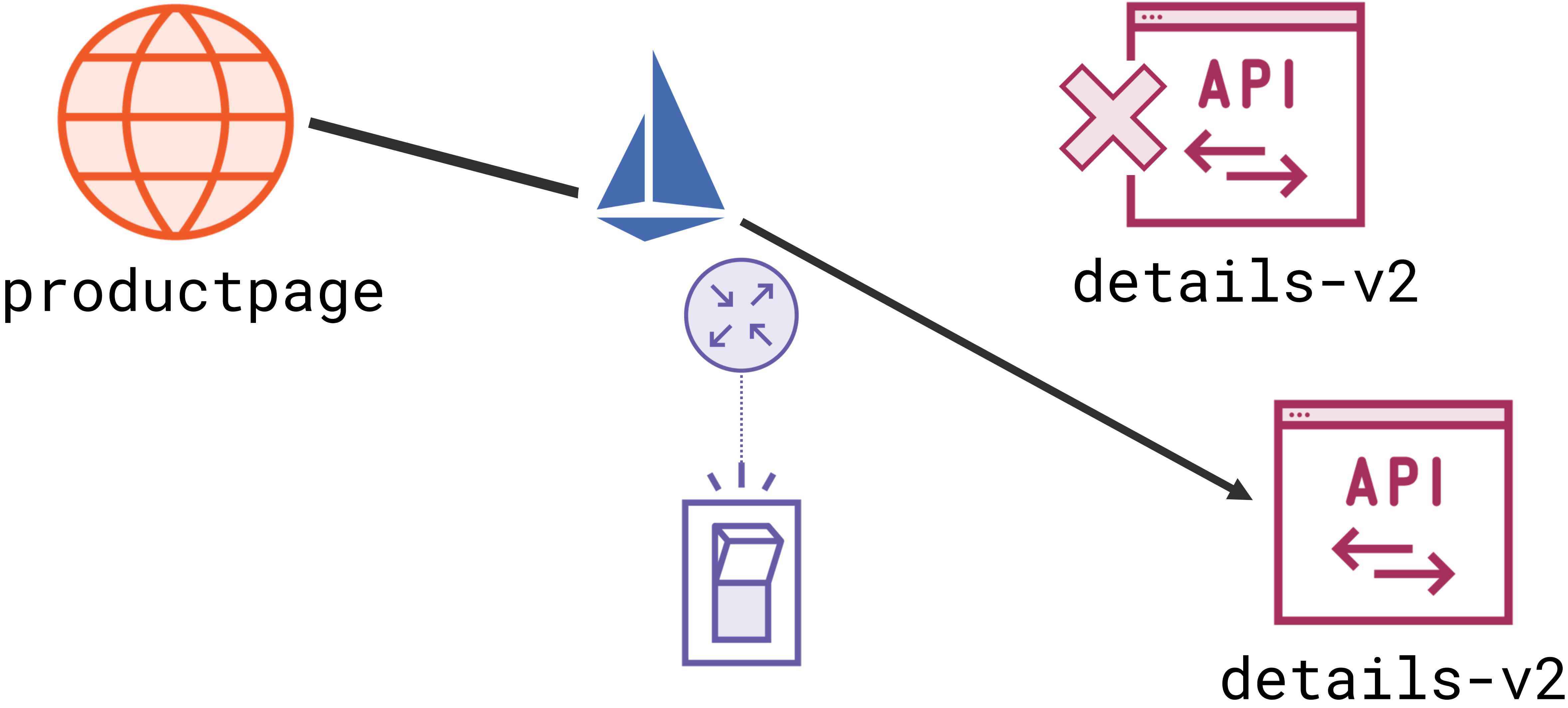


productpage-v1

productpage-v2


productpage-v1
productpage-v2

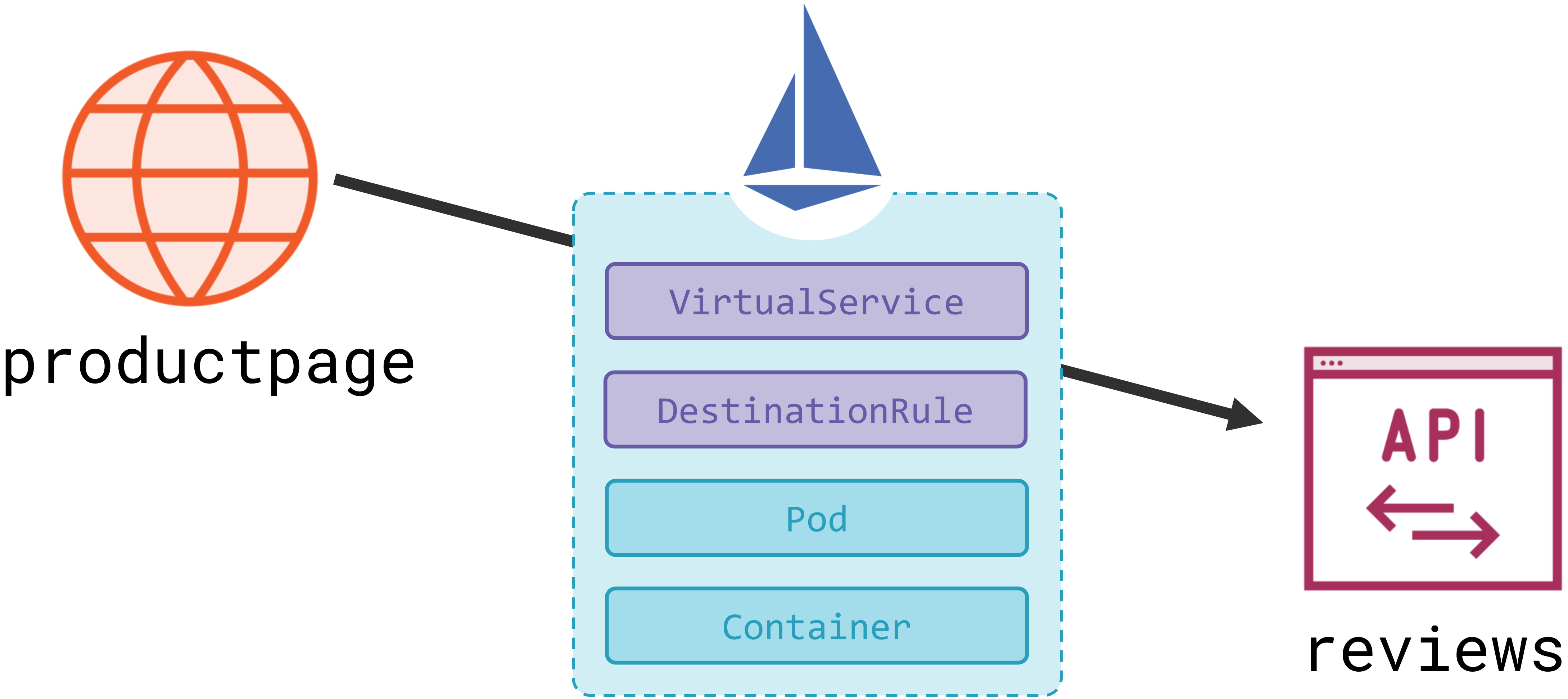

productpage
API
details-v2
API
details-v2



productpage

details-v2

details-v2


productpage
VirtualService
DestinationRule
Pod
Container
API
reviews

```yaml
apiVersion: networking.istio.io/v1alpha3
kind: VirtualService
spec:
  hosts:
  - reviews
  http:
  - route:
    - destination:
        host: reviews
        subset: v2
```

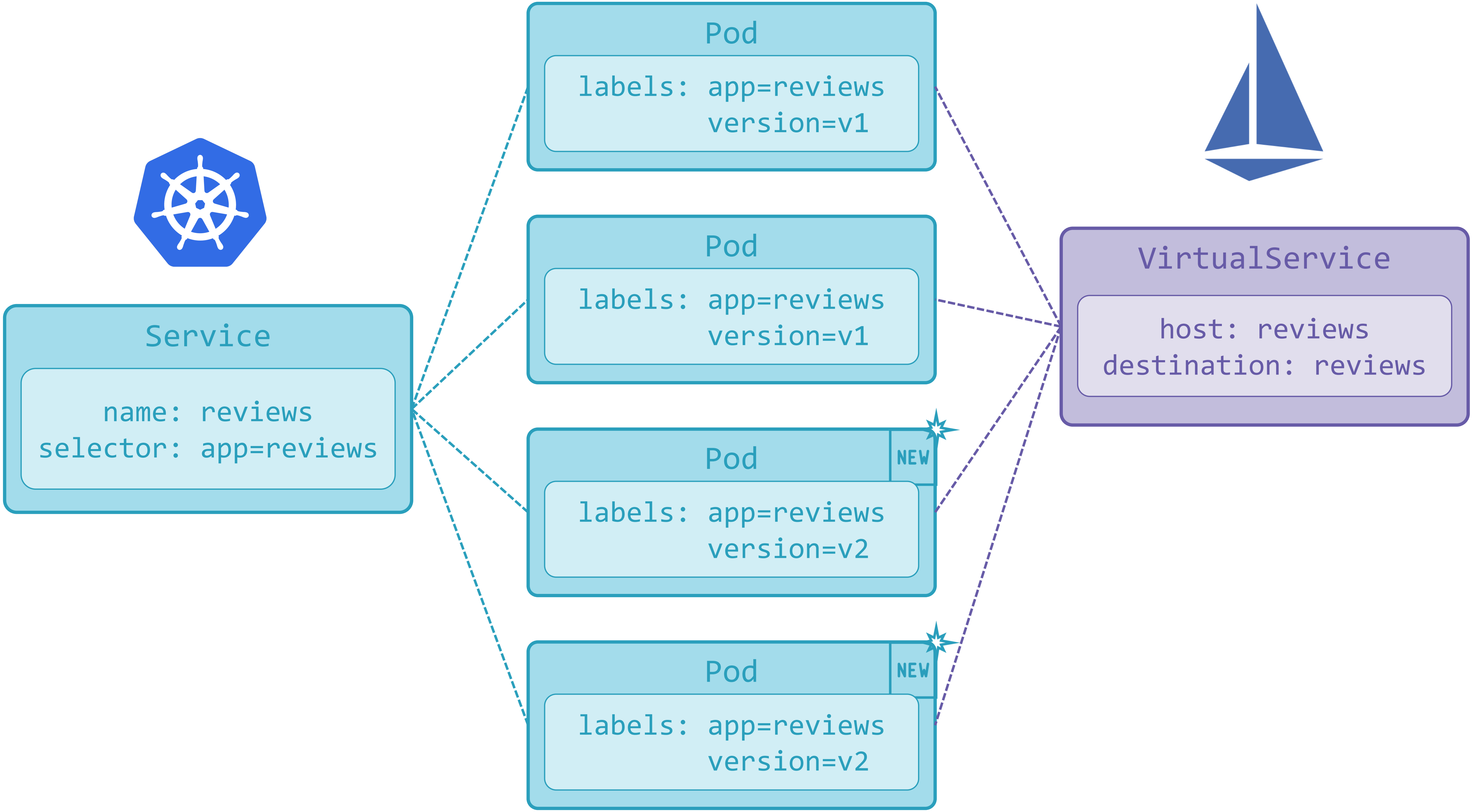
- The host requested by the client
- Routing for HTTP traffic
- The destination host routed by Istio
- The subset defined in the `DestinationRule`

```yaml
apiVersion: networking.istio.io/v1alpha3

kind: DestinationRule

spec:

  host: reviews

  subsets:

  - name: v1

    labels:

      version: v1

  - name: v2

    labels:

      version: v2
```

◀ The host requested by the client

◀ Available subsets for routing

◀ Subsets identify targets by labels



Service

name: reviews
selector: app=reviews

Pod

labels: app=reviews
version=v1

Pod

labels: app=reviews
version=v1

Pod

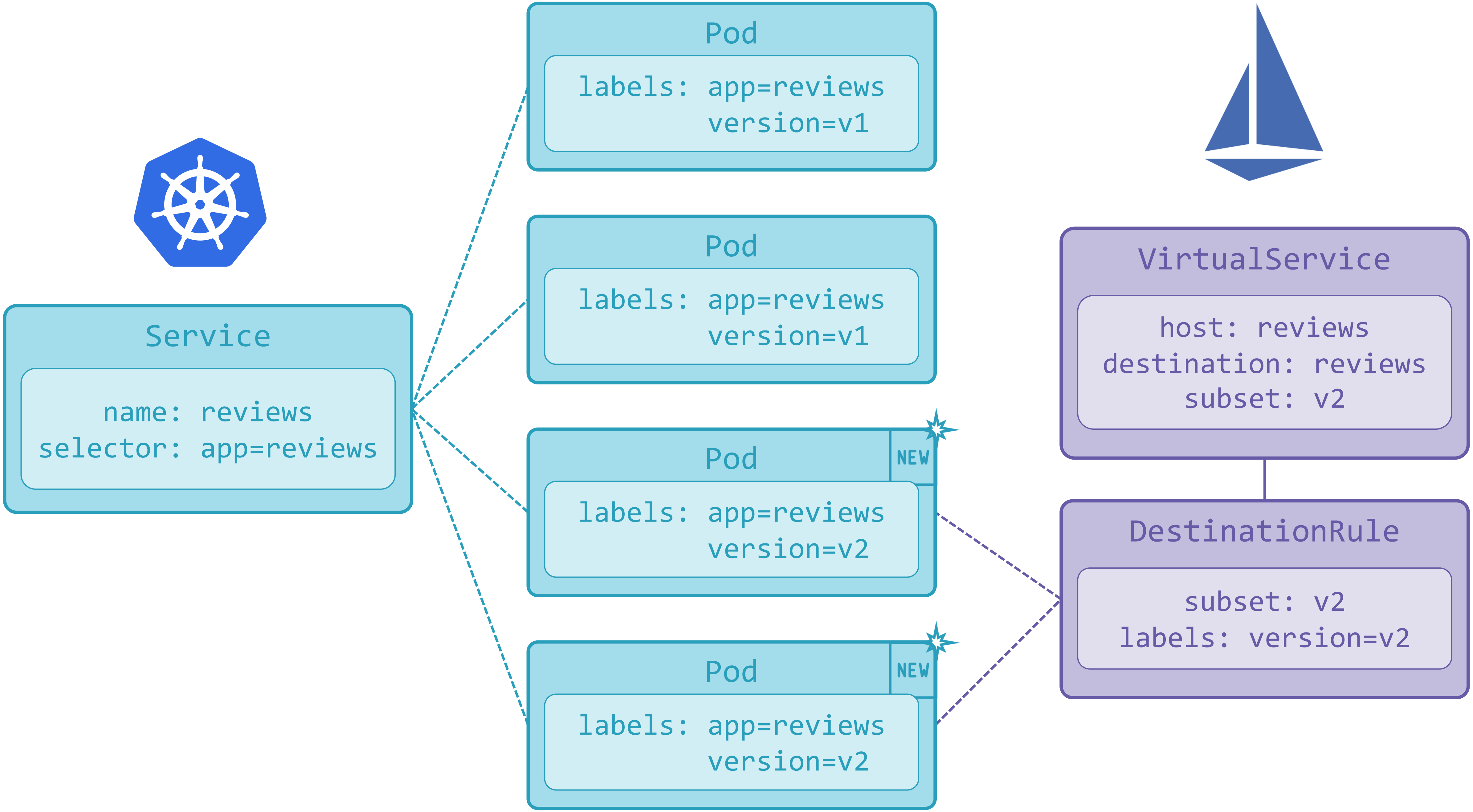
labels: app=reviews
version=v2

Pod

labels: app=reviews
version=v2

VirtualService

host: reviews
destination: reviews



Service

name: reviews
selector: app=reviews

Pod

labels: app=reviews
version=v1

Pod

labels: app=reviews
version=v1

Pod NEW

labels: app=reviews
version=v2

Pod NEW

labels: app=reviews
version=v2

VirtualService

host: reviews
destination: reviews
subset: v2

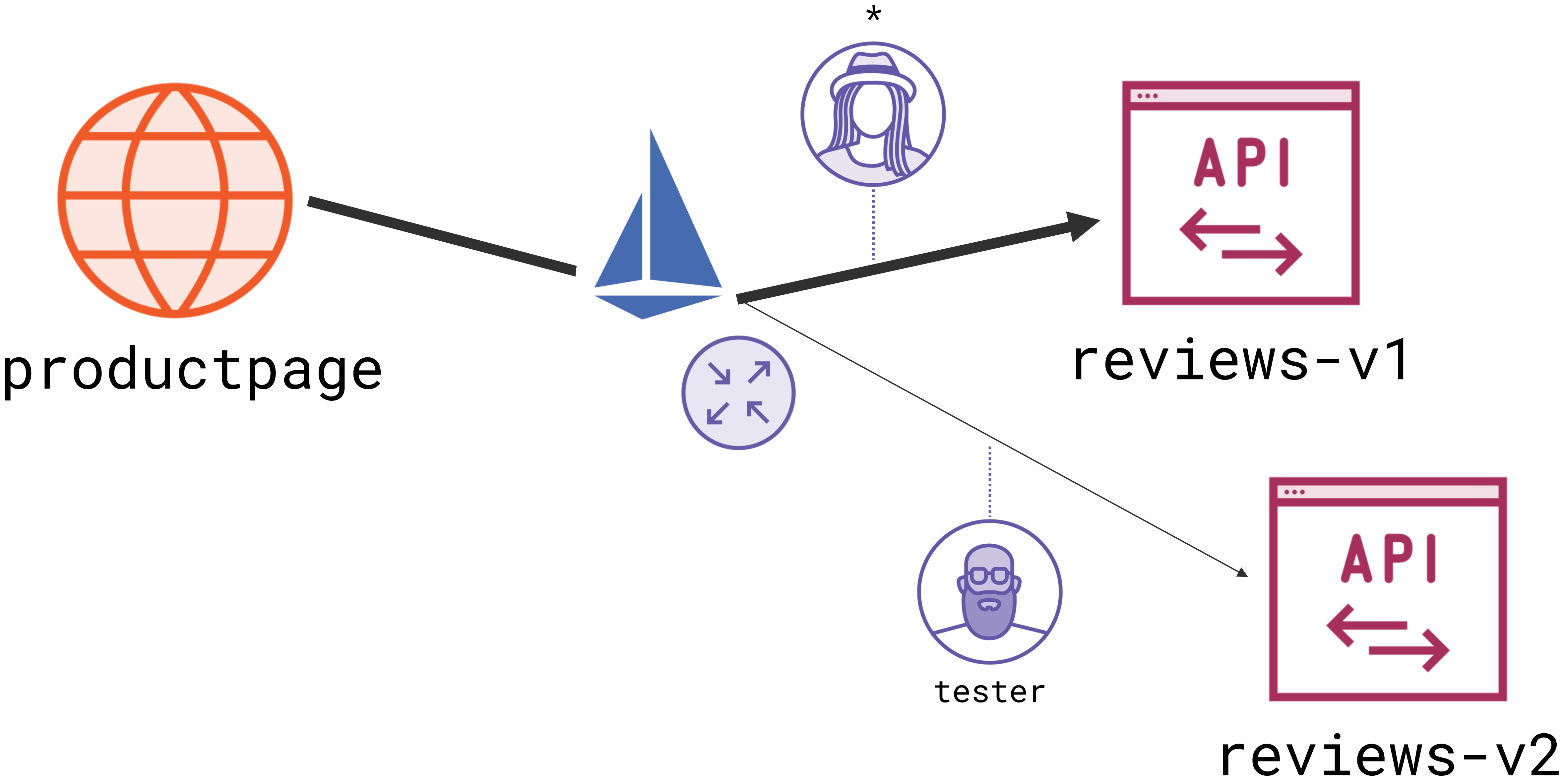
DestinationRule

subset: v2
labels: version=v2

Demo

Dark launch

- End-user routing
- Enable for test user
- Validate fault scenarios


*
productpage
reviews-v1
tester
reviews-v2

Custom Routing by User

DestinationRule.yaml

```
host: reviews
subsets:
- name: v1
  labels:
    version: v1
- name: v2
  labels:
    version: v2
```

VirtualService.yaml

```
http:
- match:
  - headers:
      end-user:
        exact: tester
  route:
  - destination:
      host: reviews
      subset: v2
```

Delay Injection

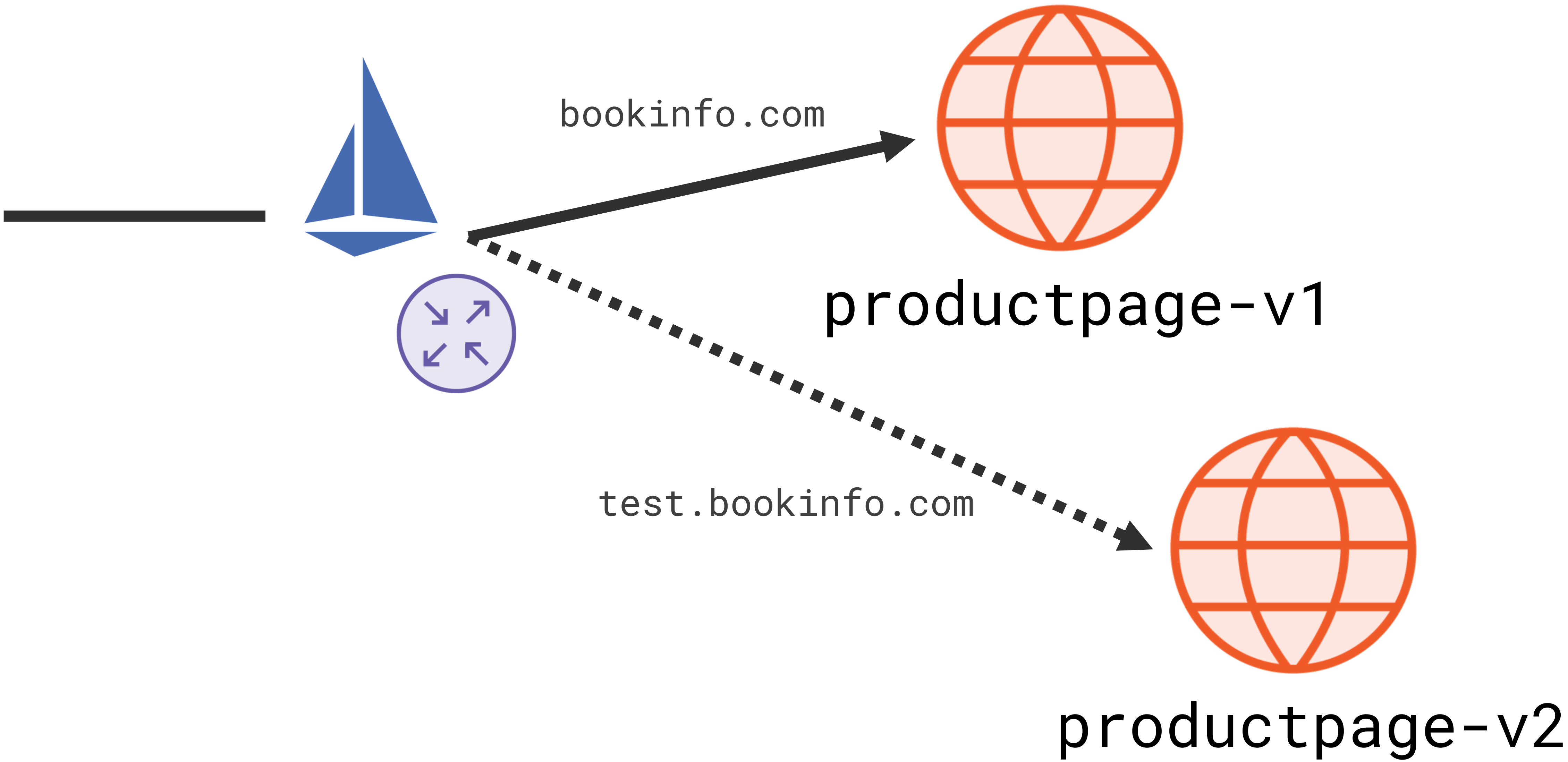
VirtualService.yaml

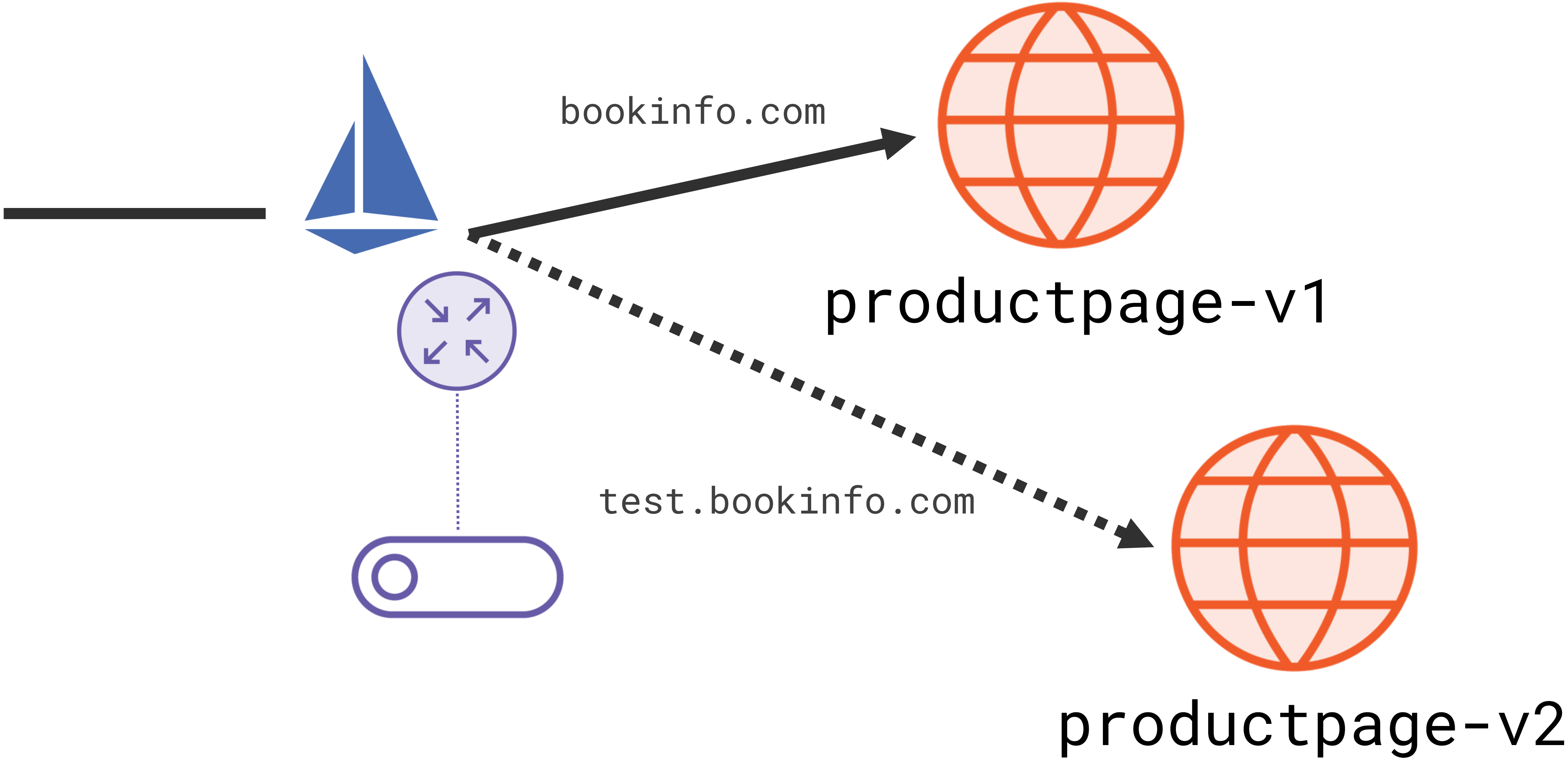
```yaml
http:
- match:
 - headers:
   end-user:
    exact: tester
 fault:
  delay:
   percent: 100
   fixedDelay: 2.5s
 route:
 - destination:
   host: reviews
   subset: v2
- route:
 - destination:
   host: reviews
   subset: v1
```

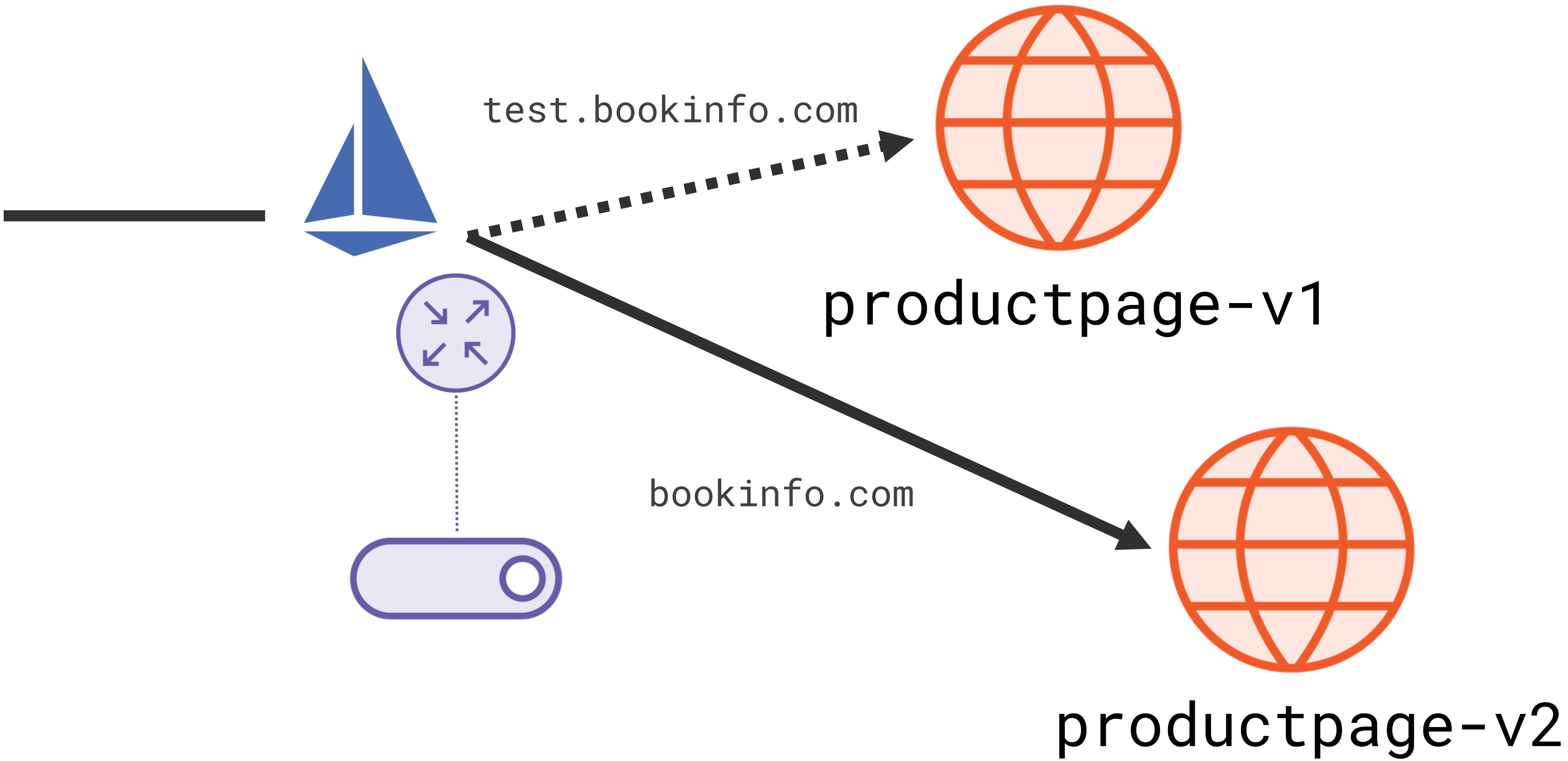
Fault Injection

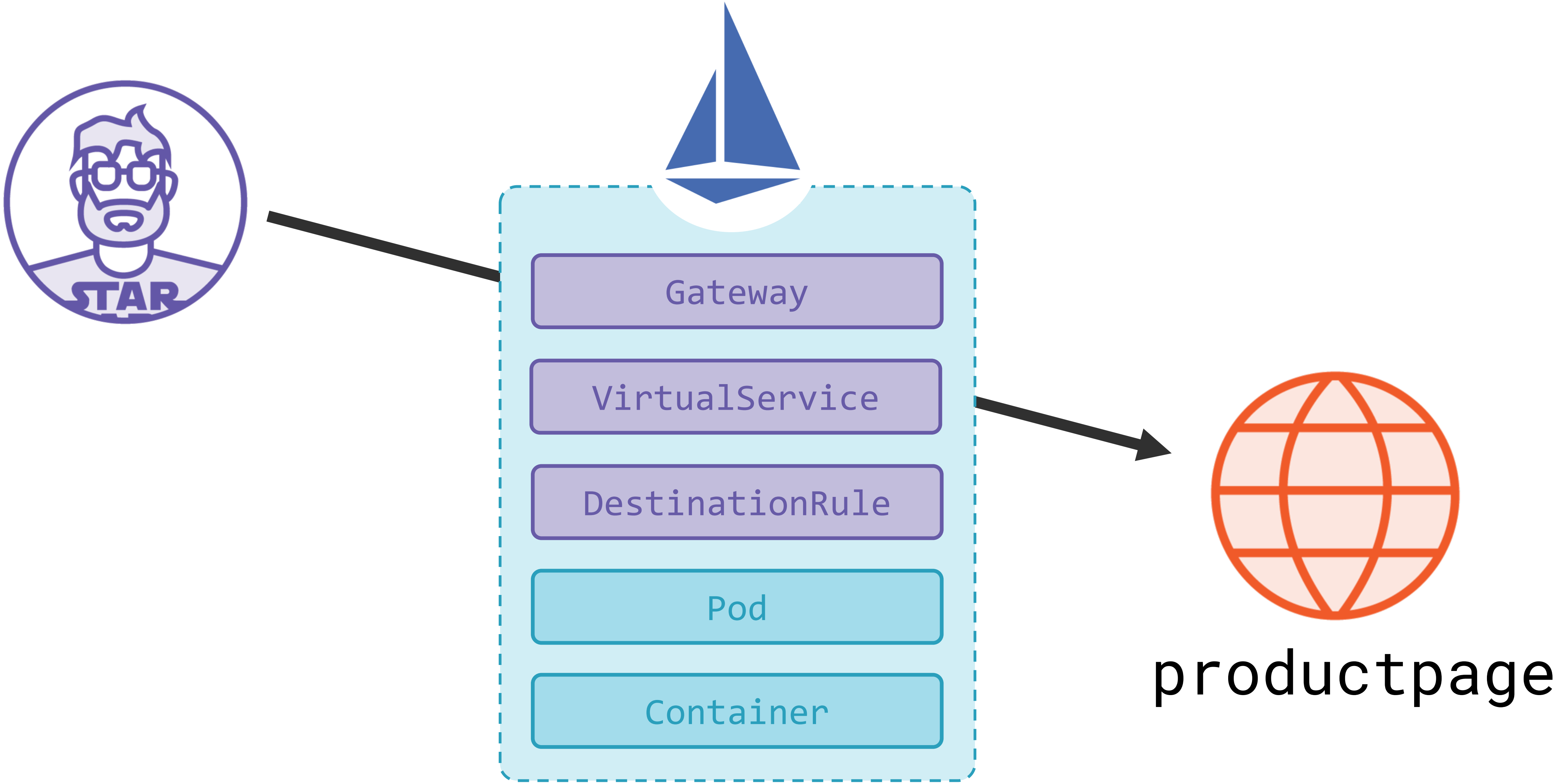
VirtualService.yaml

```yaml
http:
- match:
  - headers:
      end-user:
        exact: tester
  fault:
    abort:
      percent: 50
      httpStatus: 503
  route:
  - destination:
      host: reviews
      subset: v2
- route:
  - destination:
      host: reviews
      subset: v1
```


bookinfo.com
productpage-v1
test.bookinfo.com
productpage-v2


bookinfo.com
productpage-v1
test.bookinfo.com
productpage-v2


test.bookinfo.com
productpage-v1
bookinfo.com
productpage-v2



Gateway

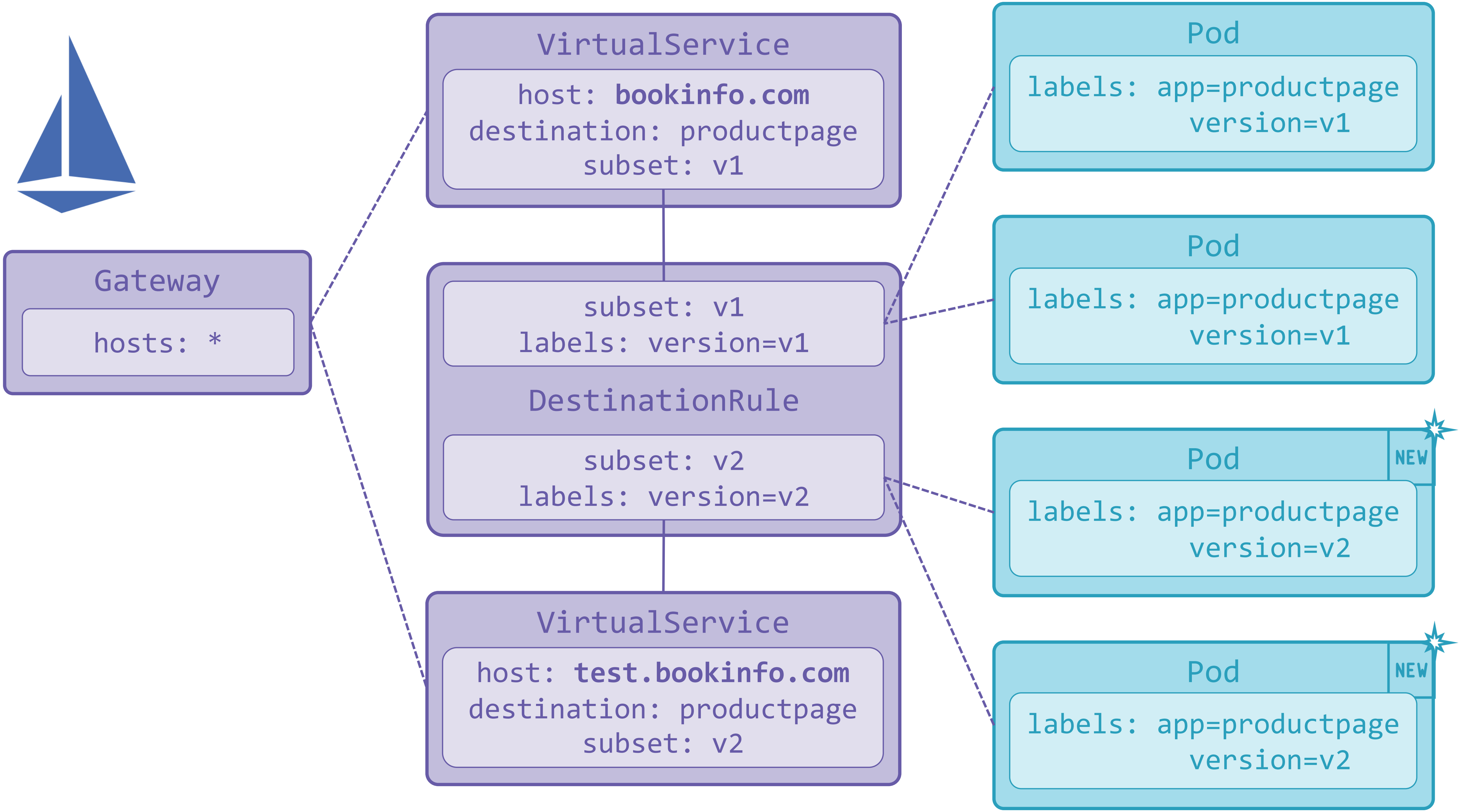
VirtualService

DestinationRule

Pod

Container

productpage



Gateway

hosts: *

VirtualService

host: **bookinfo.com**
destination: productpage
subset: v1

subset: v1
labels: version=v1

DestinationRule

subset: v2
labels: version=v2

VirtualService

host: **test.bookinfo.com**
destination: productpage
subset: v2

Pod

labels: app=productpage
version=v1

Pod

labels: app=productpage
version=v1

Pod

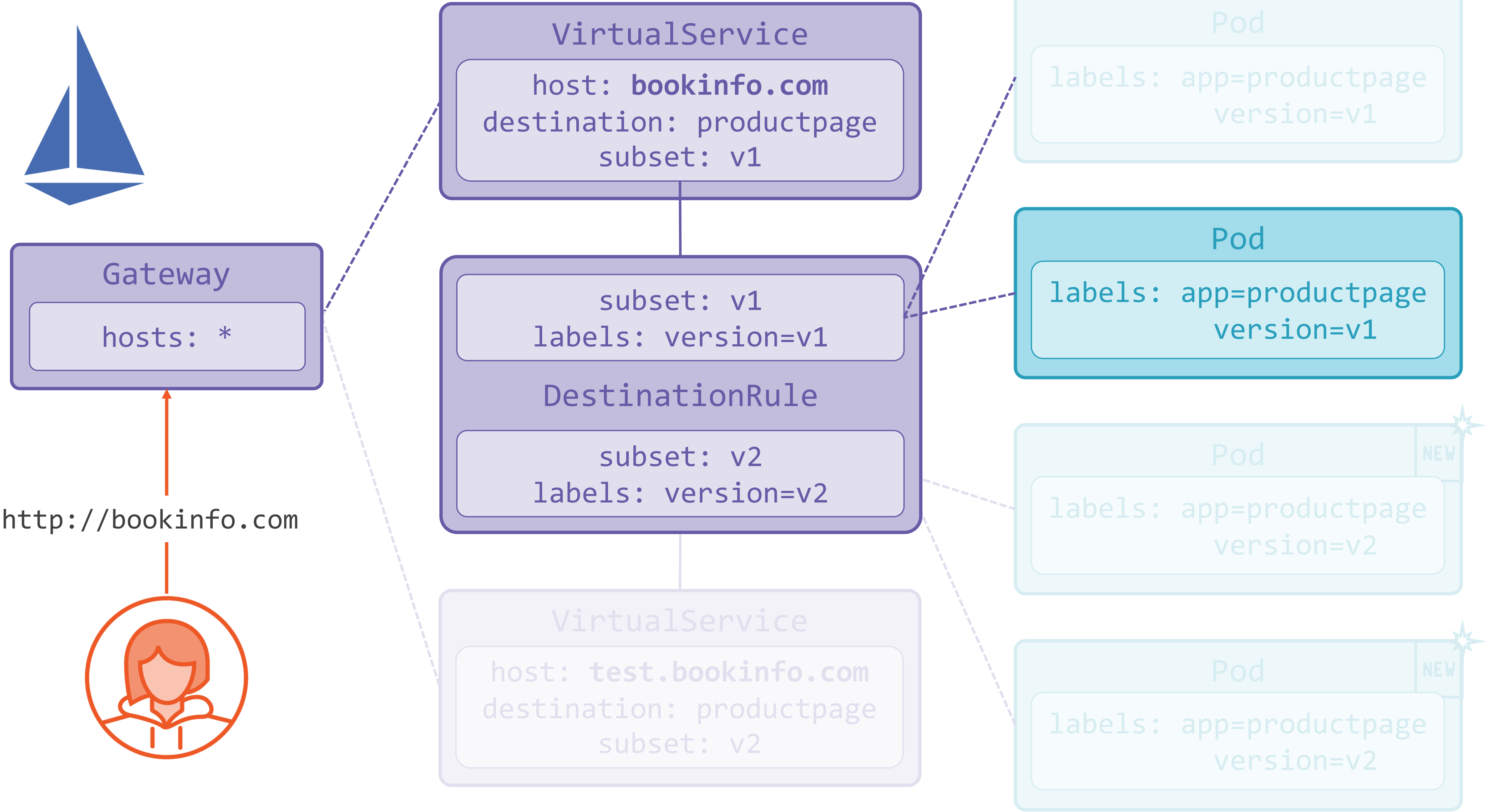
NEW

labels: app=productpage
version=v2

Pod

NEW

labels: app=productpage
version=v2



Gateway

hosts: *

http://bookinfo.com

VirtualService

host: **bookinfo.com**
destination: productpage
subset: v1

subset: v1
labels: version=v1

DestinationRule

subset: v2
labels: version=v2

VirtualService

host: **test.bookinfo.com**
destination: productpage
subset: v2

Pod

labels: app=productpage
version=v1

Pod

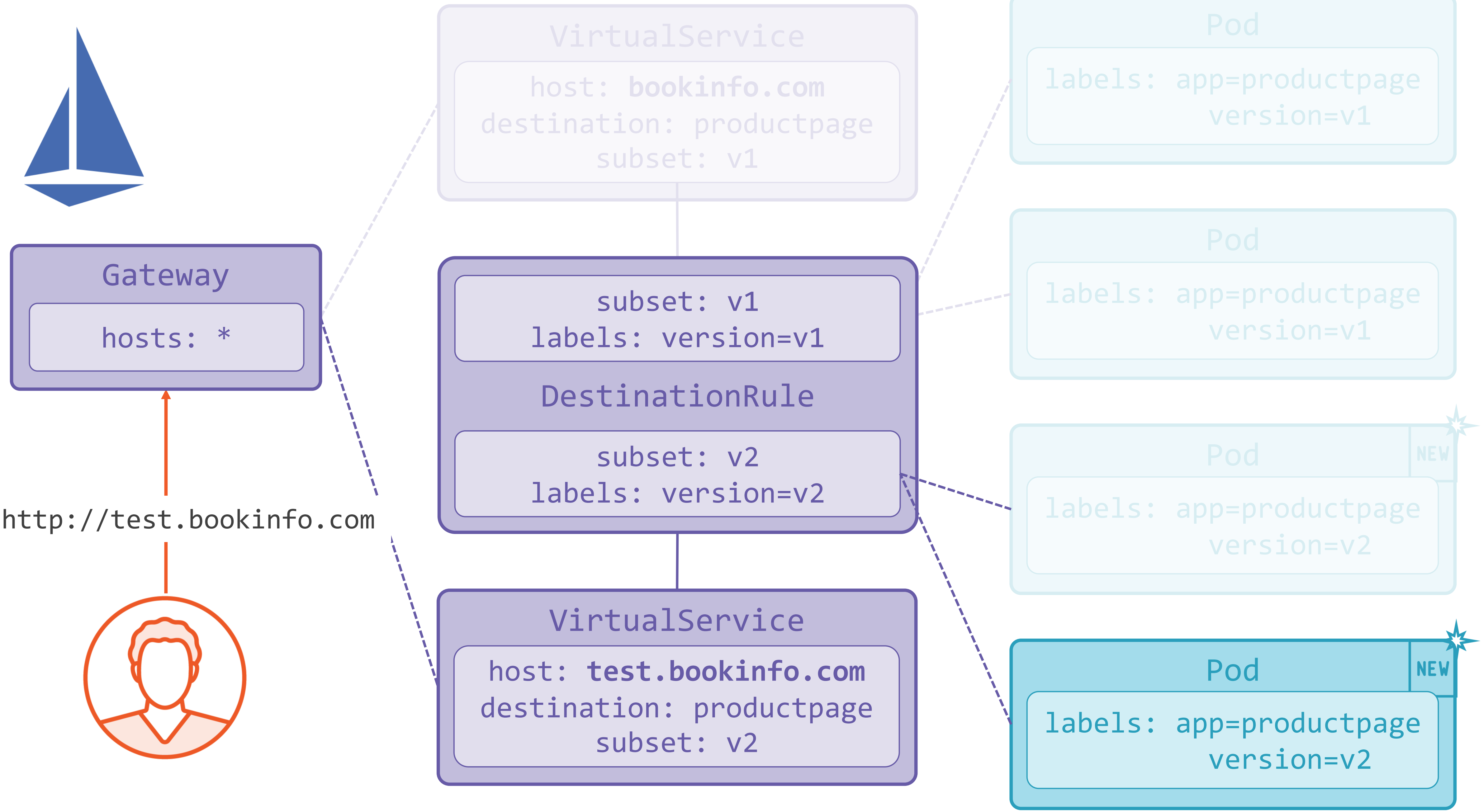
labels: app=productpage
version=v1

Pod NEW

labels: app=productpage
version=v2

Pod NEW

labels: app=productpage
version=v2



Gateway

hosts: *

http://test.bookinfo.com

VirtualService

host: **bookinfo.com**
destination: productpage
subset: v1

subset: v1
labels: version=v1

DestinationRule

subset: v2
labels: version=v2

VirtualService

host: **test.bookinfo.com**
destination: productpage
subset: v2

Pod

labels: app=productpage
version=v1

Pod

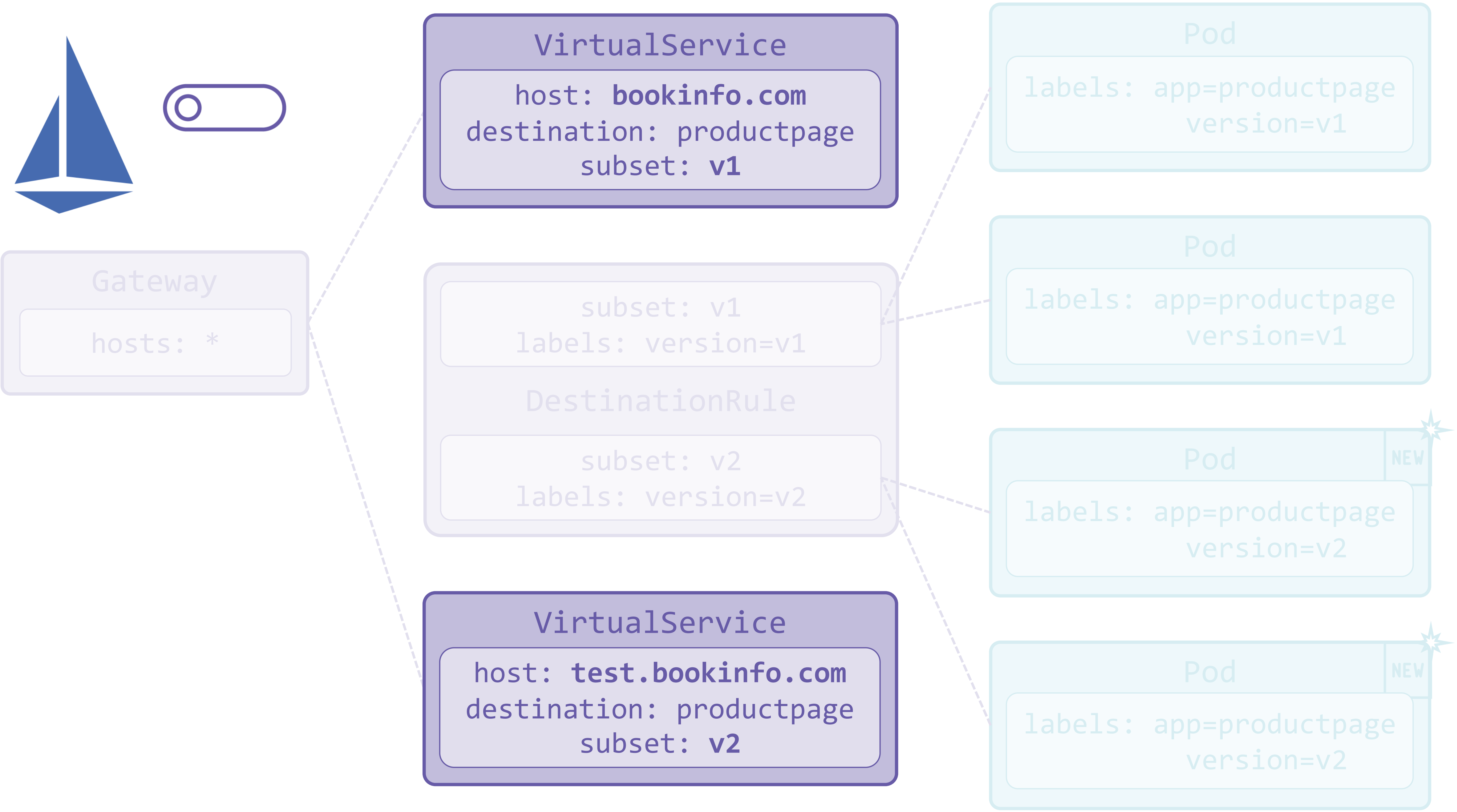
labels: app=productpage
version=v1

Pod NEW

labels: app=productpage
version=v2

Pod NEW

labels: app=productpage
version=v2



VirtualService

host: **bookinfo.com**
destination: productpage
subset: **v1**

Gateway

hosts: *

subset: v1
labels: version=v1

DestinationRule

subset: v2
labels: version=v2

VirtualService

host: **test.bookinfo.com**
destination: productpage
subset: **v2**

Pod

labels: app=productpage
version=v1

Pod

labels: app=productpage
version=v1

Pod

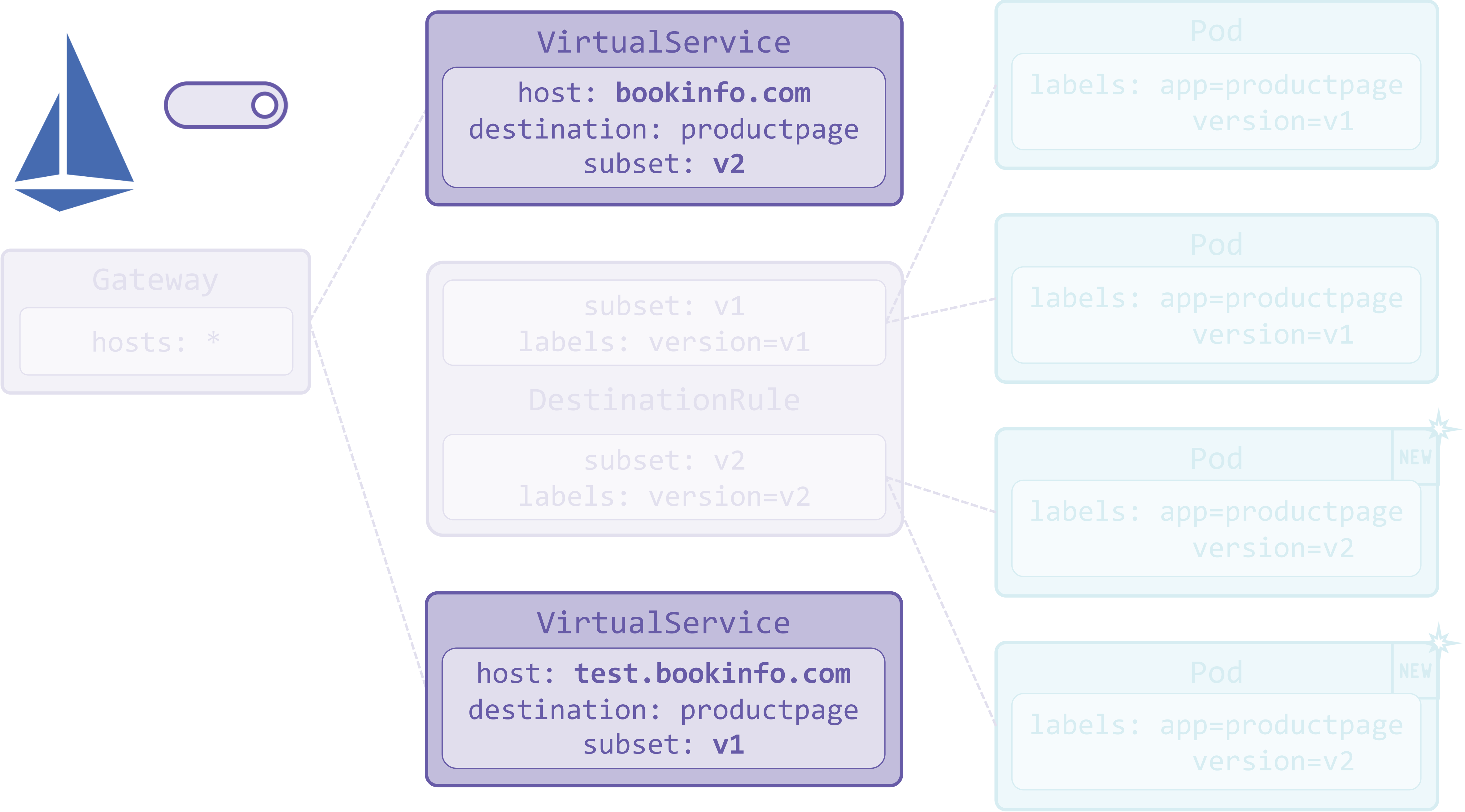
NEW

labels: app=productpage
version=v2

Pod

NEW

labels: app=productpage
version=v2



Gateway

hosts: *

VirtualService

host: **bookinfo.com**
destination: productpage
subset: **v2**

subset: v1
labels: version=v1

DestinationRule

subset: v2
labels: version=v2

VirtualService

host: **test.bookinfo.com**
destination: productpage
subset: **v1**

Pod

labels: app=productpage
version=v1

Pod

labels: app=productpage
version=v1

Pod

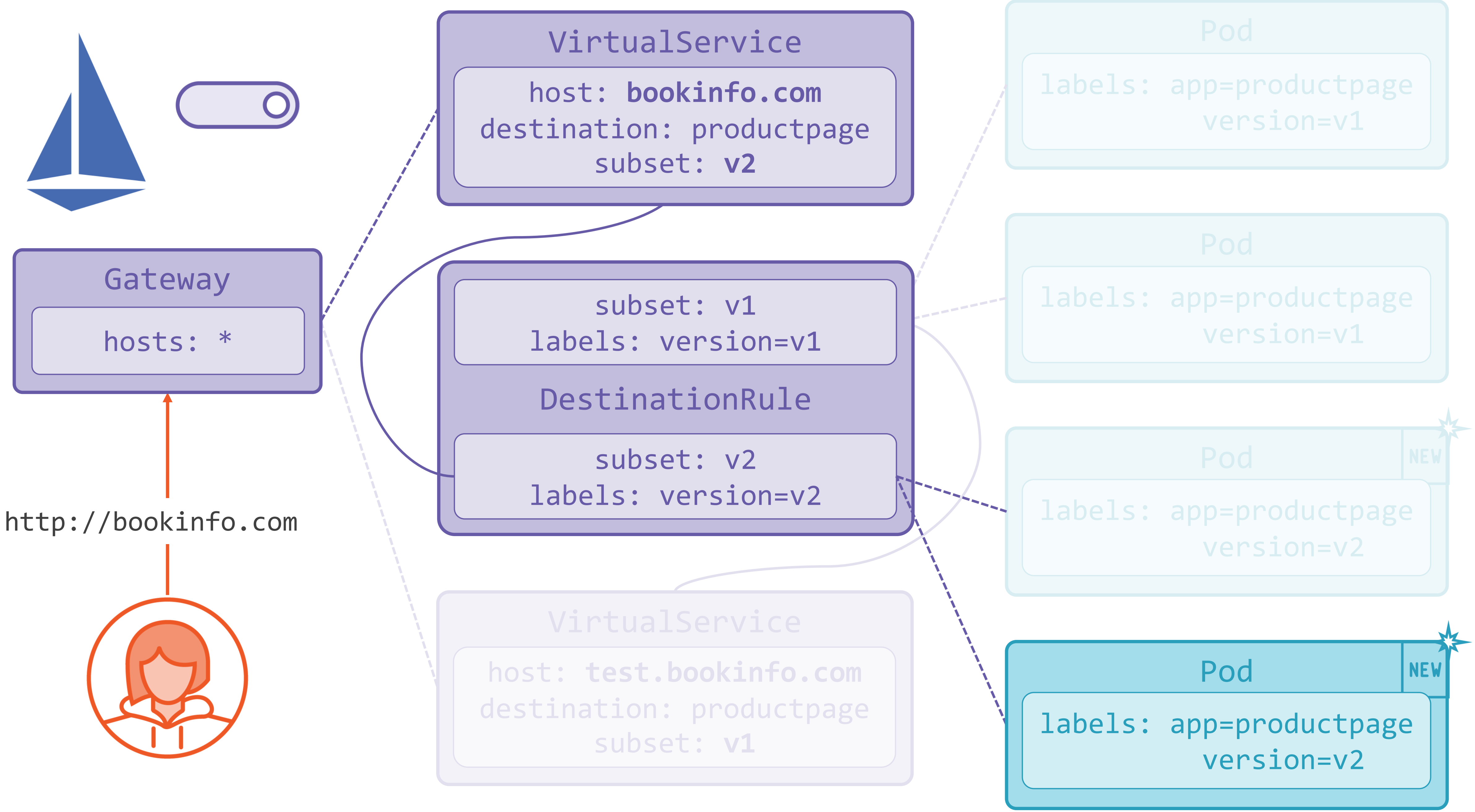
NEW

labels: app=productpage
version=v2

Pod

NEW

labels: app=productpage
version=v2

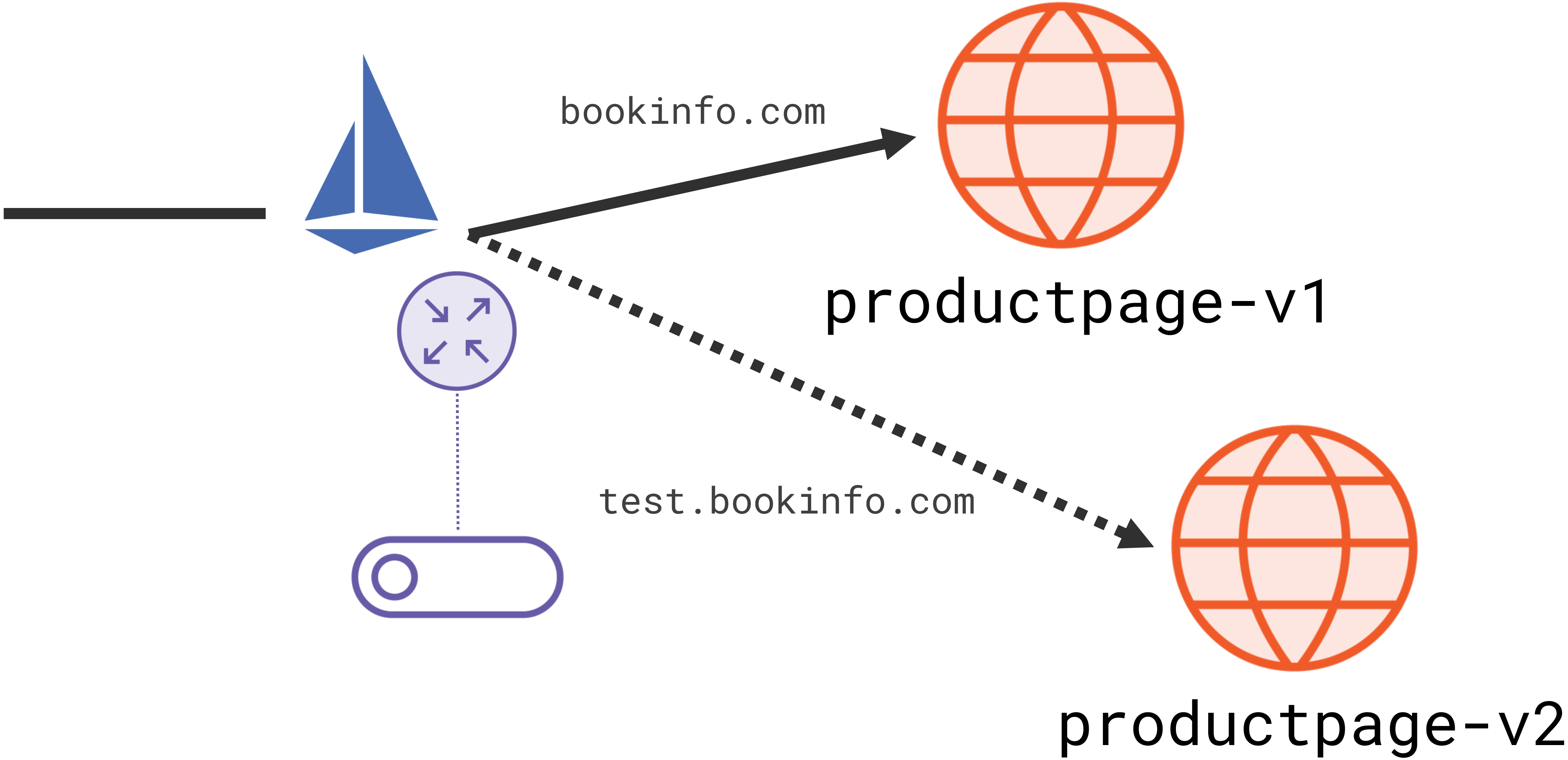


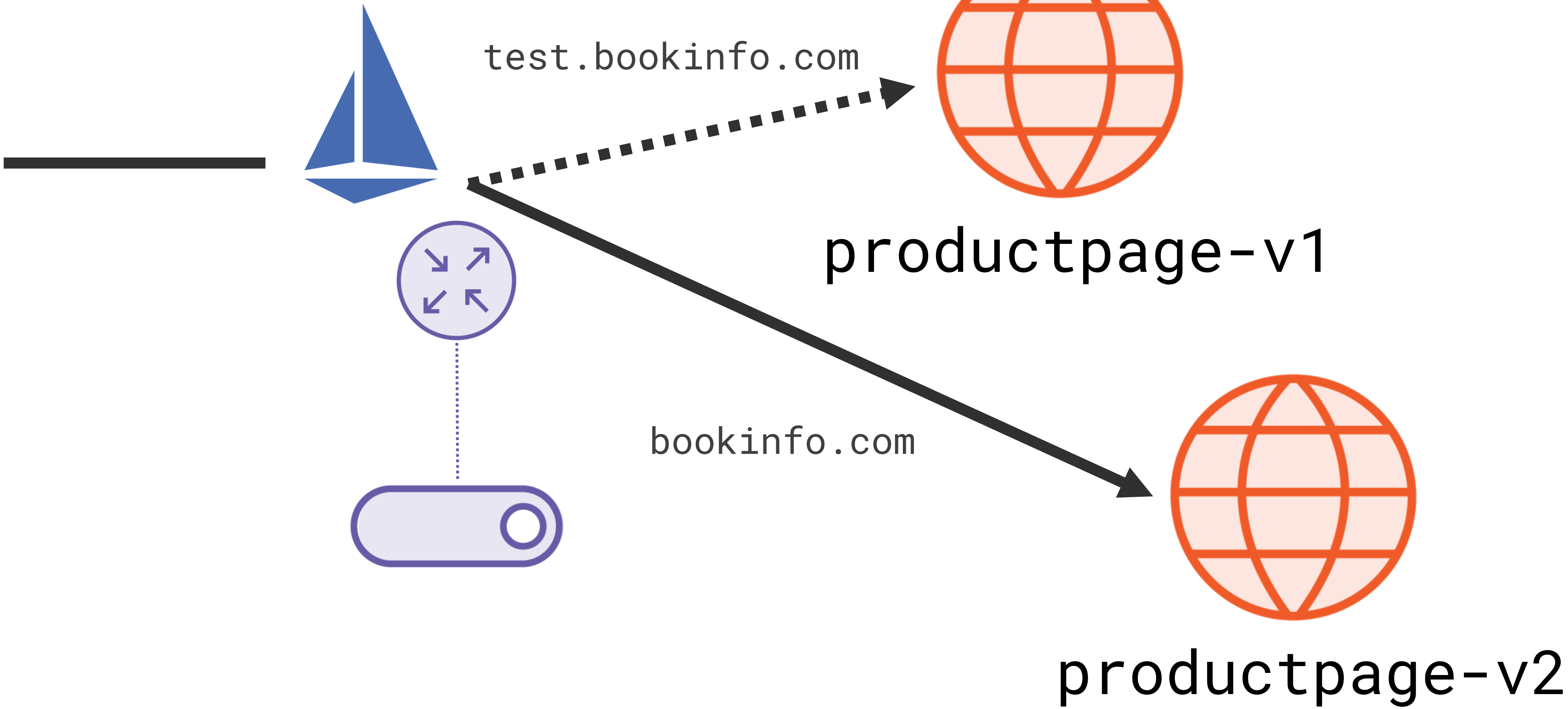
VirtualService
host: bookinfo.com
destination: productpage
subset: v2
Gateway
hosts: *
subset: v1
labels: version=v1
DestinationRule
subset: v2
labels: version=v2
http://bookinfo.com
VirtualService
host: test.bookinfo.com
destination: productpage
subset: v1
Pod
labels: app=productpage
version=v1
Pod
labels: app=productpage
version=v1
Pod
NEW
labels: app=productpage
version=v2
Pod
NEW
labels: app=productpage
version=v2

Demo

Blue/green deployment

- Live and test domains
- Switch from test to live
- And back again


bookinfo.com
productpage-v1
test.bookinfo.com
productpage-v2


test.bookinfo.com
productpage-v1
bookinfo.com
productpage-v2

Blue/Green Deployments

VirtualService-Live.yaml

```yaml
hosts:
 - bookinfo.local
gateways:
 - bookinfo-gateway
http:
 - route:
   - destination:
     host: productpage
     subset: v1
```

VirtualService-Test.yaml

```yaml
hosts:
 - test.bookinfo.local
gateways:
 - bookinfo-gateway
http:
 - route:
   - destination:
     host: productpage
     subset: v2
```

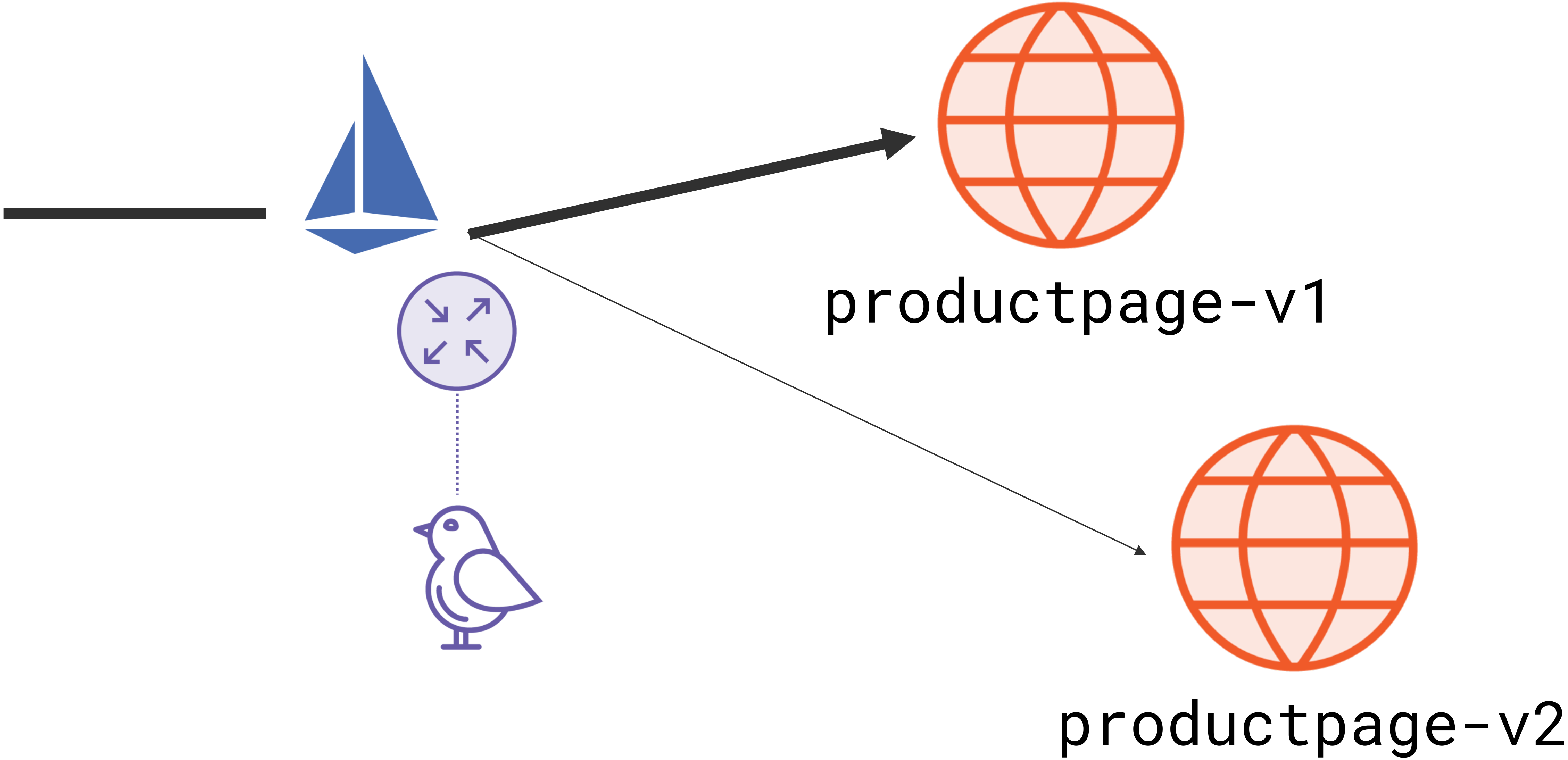
Blue/Green Deployments

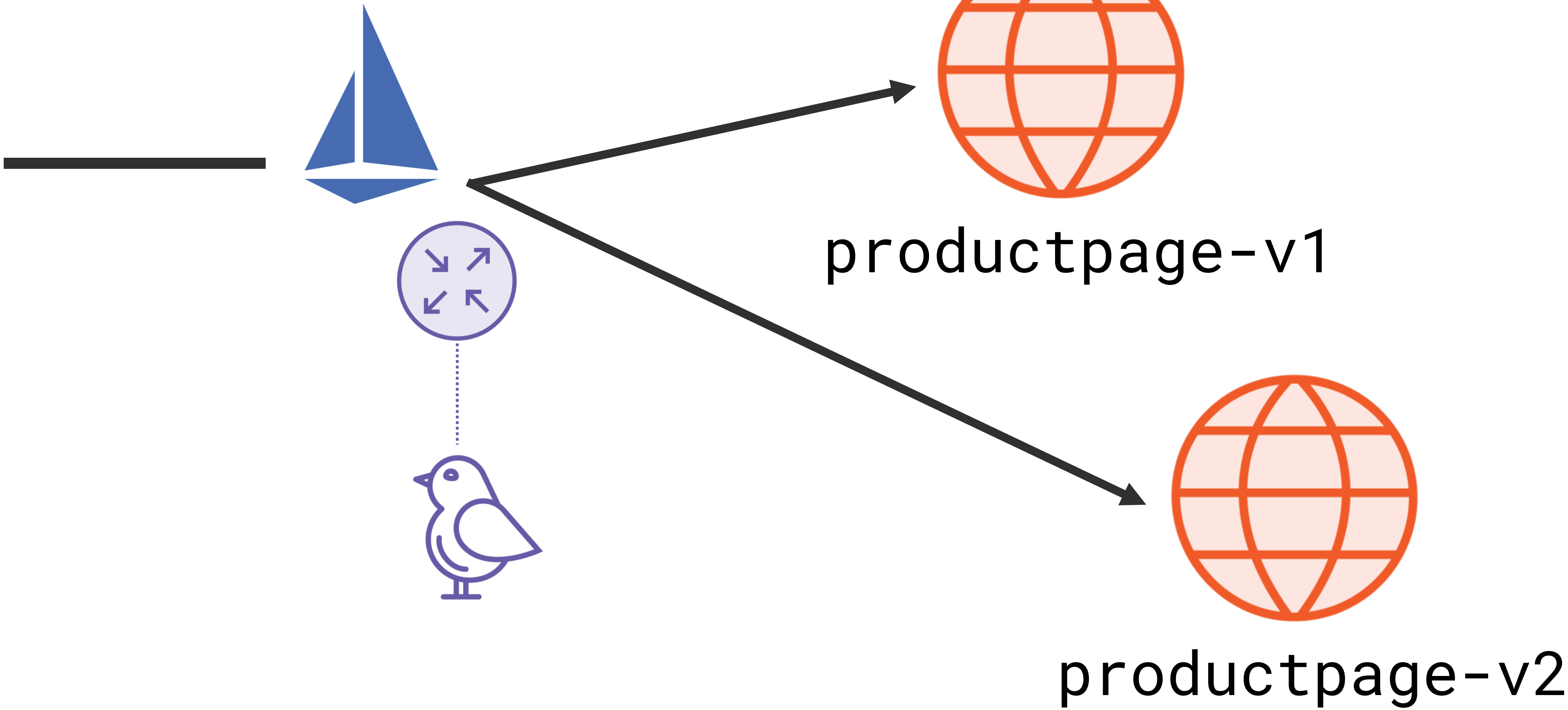
VirtualService-Live.yaml

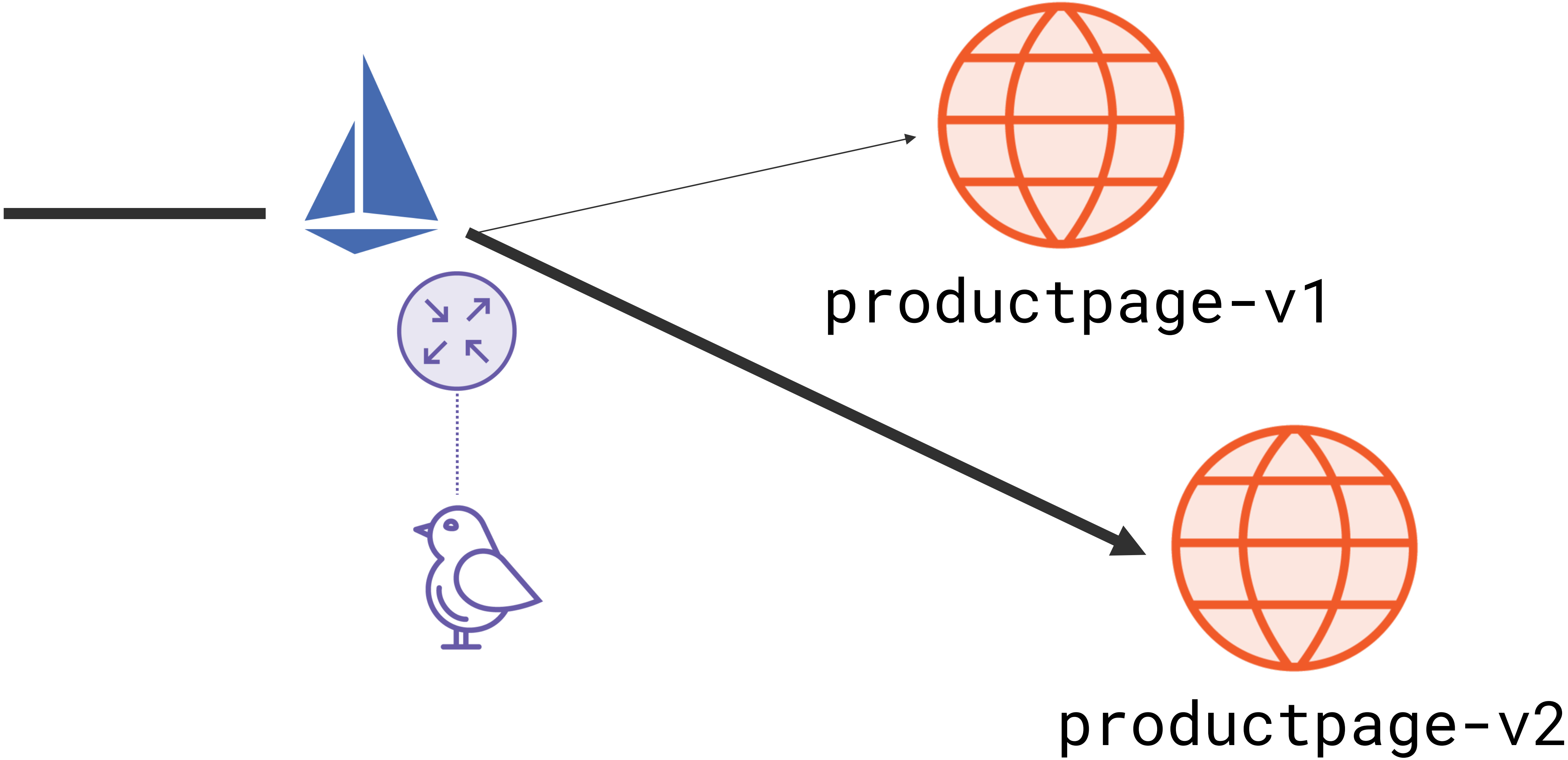
```yaml
hosts:
 - bookinfo.local
gateways:
 - bookinfo-gateway
http:
 - route:
   - destination:
     host: productpage
     subset: v2
```

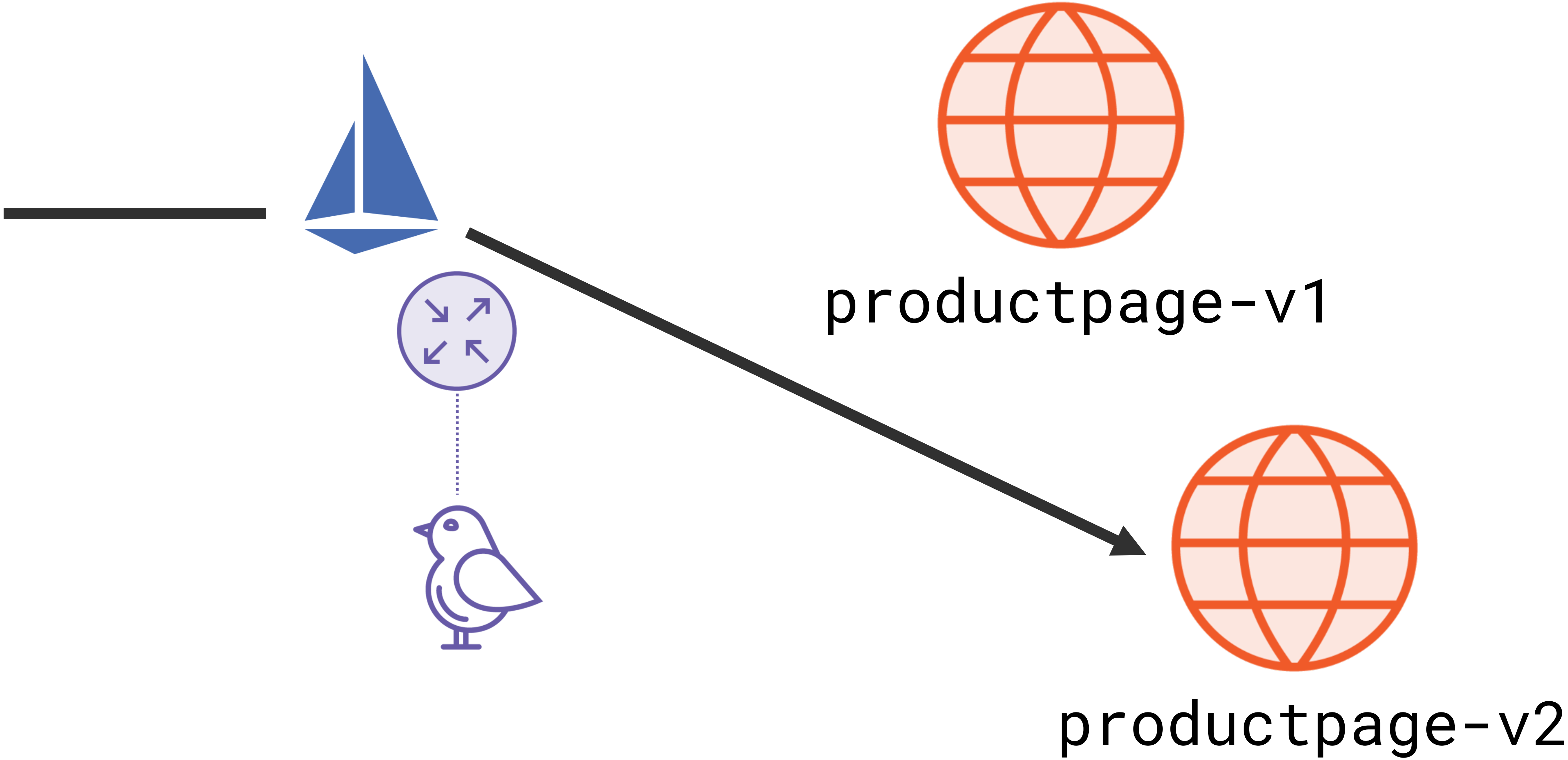
VirtualService-Test.yaml

```yaml
hosts:
 - test.bookinfo.local
gateways:
 - bookinfo-gateway
http:
 - route:
   - destination:
     host: productpage
     subset: v1
```


productpage-v1
productpage-v2

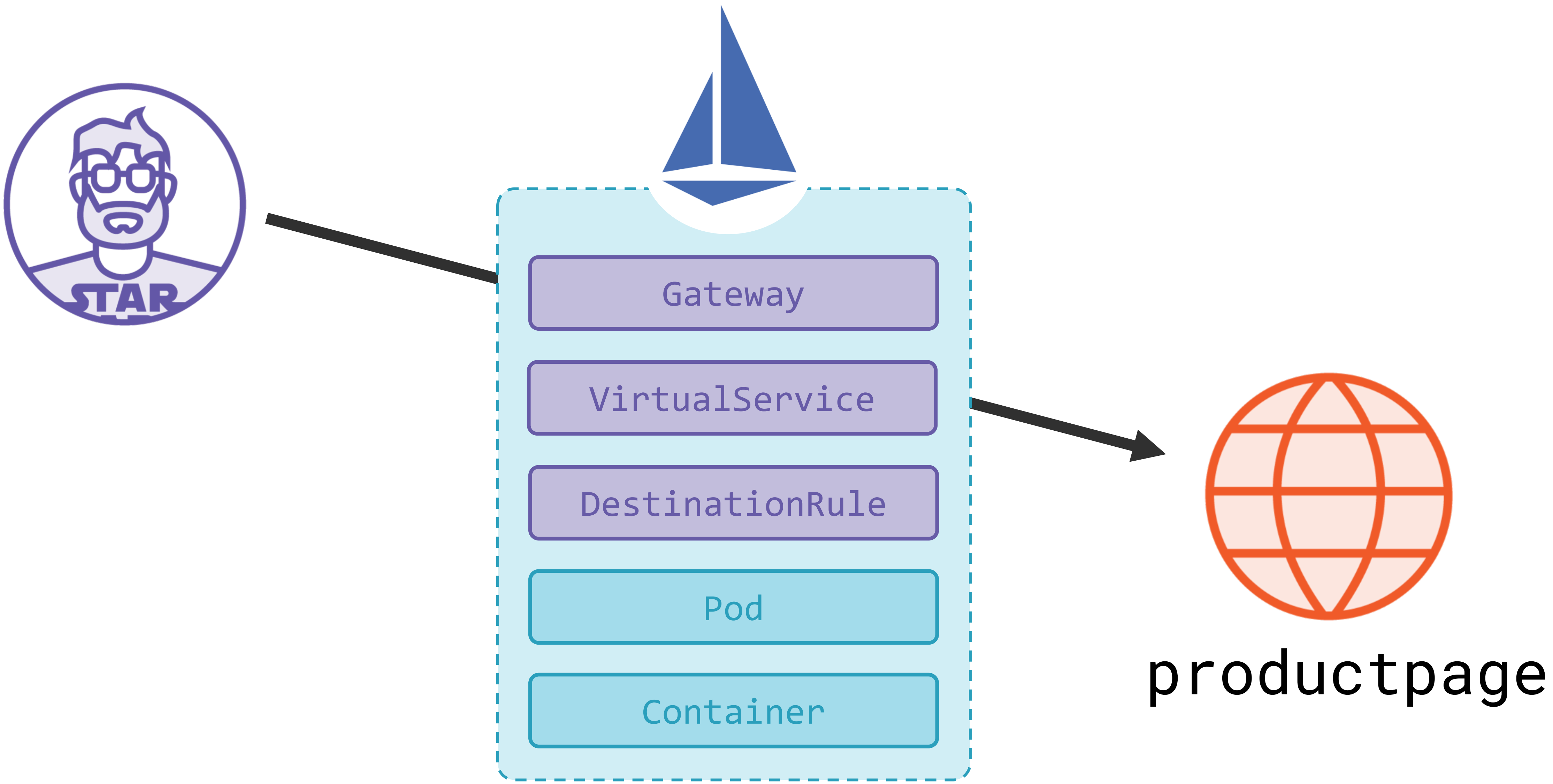

productpage-v1
productpage-v2


productpage-v1
productpage-v2



productpage-v1

productpage-v2



Gateway

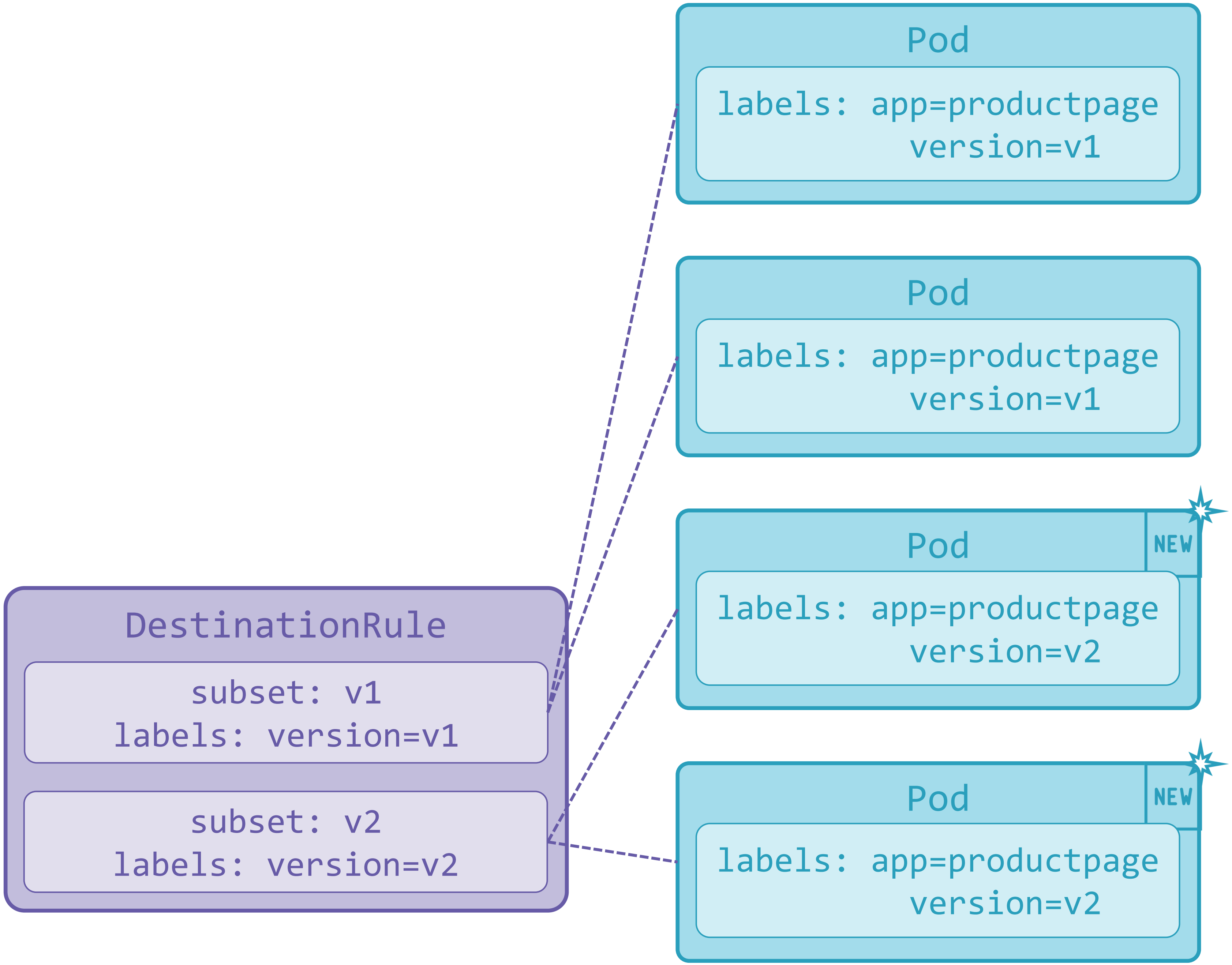
VirtualService

DestinationRule

Pod

Container

productpage



DestinationRule

subset: v1
labels: version=v1

subset: v2
labels: version=v2

Pod

labels: app=productpage
version=v1

Pod

labels: app=productpage
version=v1

Pod

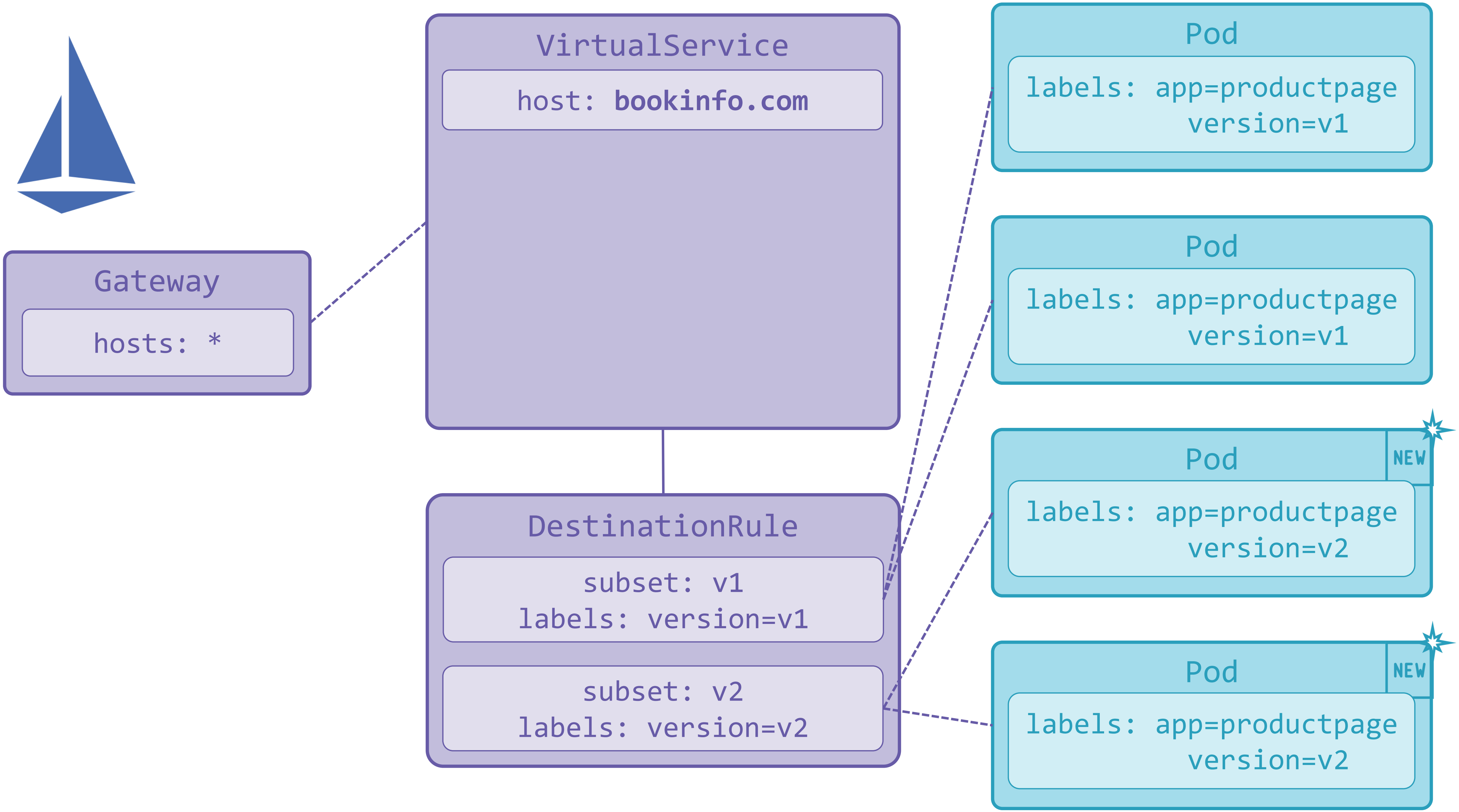
NEW

labels: app=productpage
version=v2

Pod

NEW

labels: app=productpage
version=v2



Gateway

hosts: *

VirtualService

host: **bookinfo.com**

DestinationRule

subset: v1
labels: version=v1

subset: v2
labels: version=v2

Pod

labels: app=productpage
version=v1

Pod

labels: app=productpage
version=v1

Pod

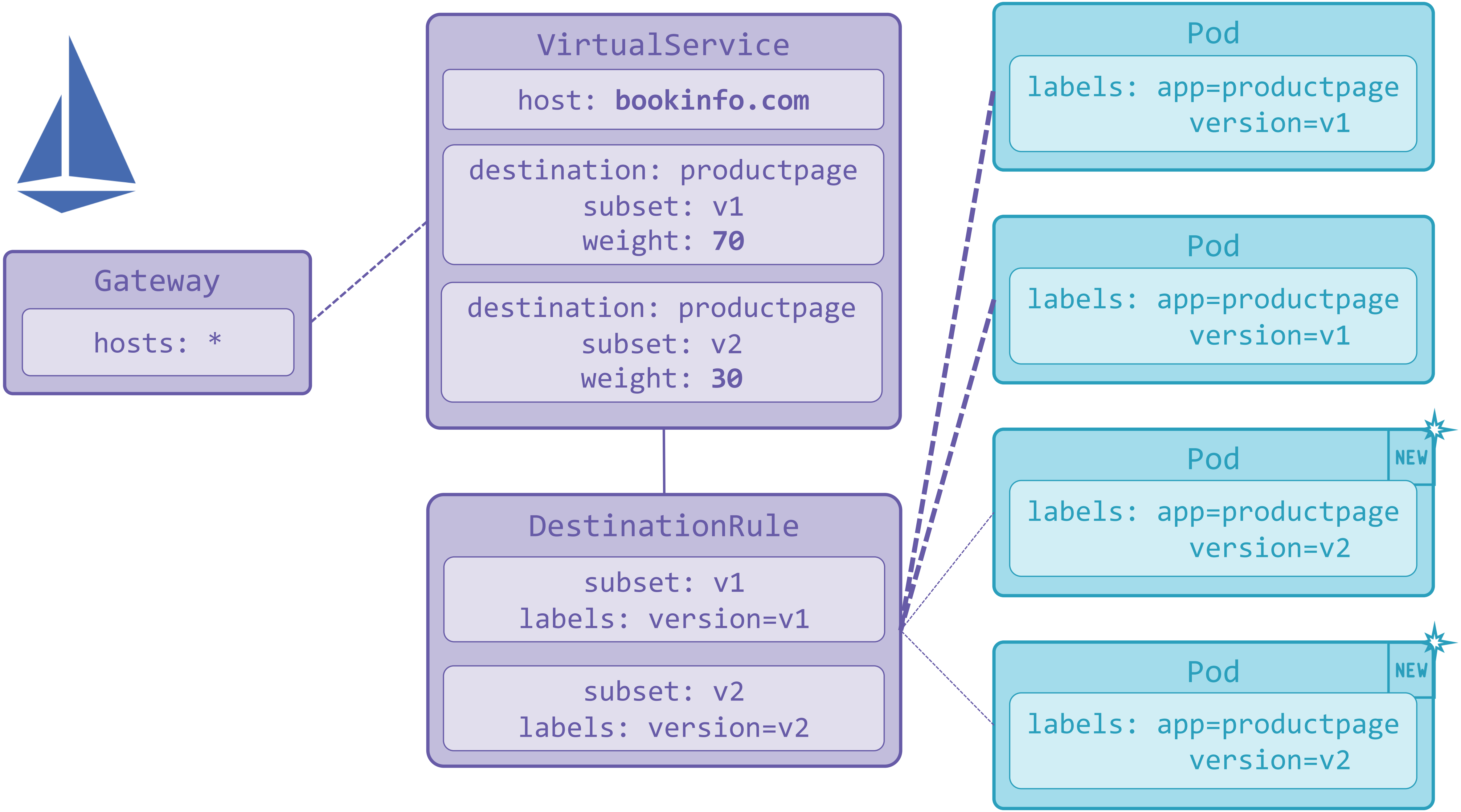
NEW

labels: app=productpage
version=v2

Pod

NEW

labels: app=productpage
version=v2



Gateway

hosts: *

VirtualService

host: **bookinfo.com**

destination: productpage
subset: v1
weight: **70**

destination: productpage
subset: v2
weight: **30**

DestinationRule

subset: v1
labels: version=v1

subset: v2
labels: version=v2

Pod

labels: app=productpage
version=v1

Pod

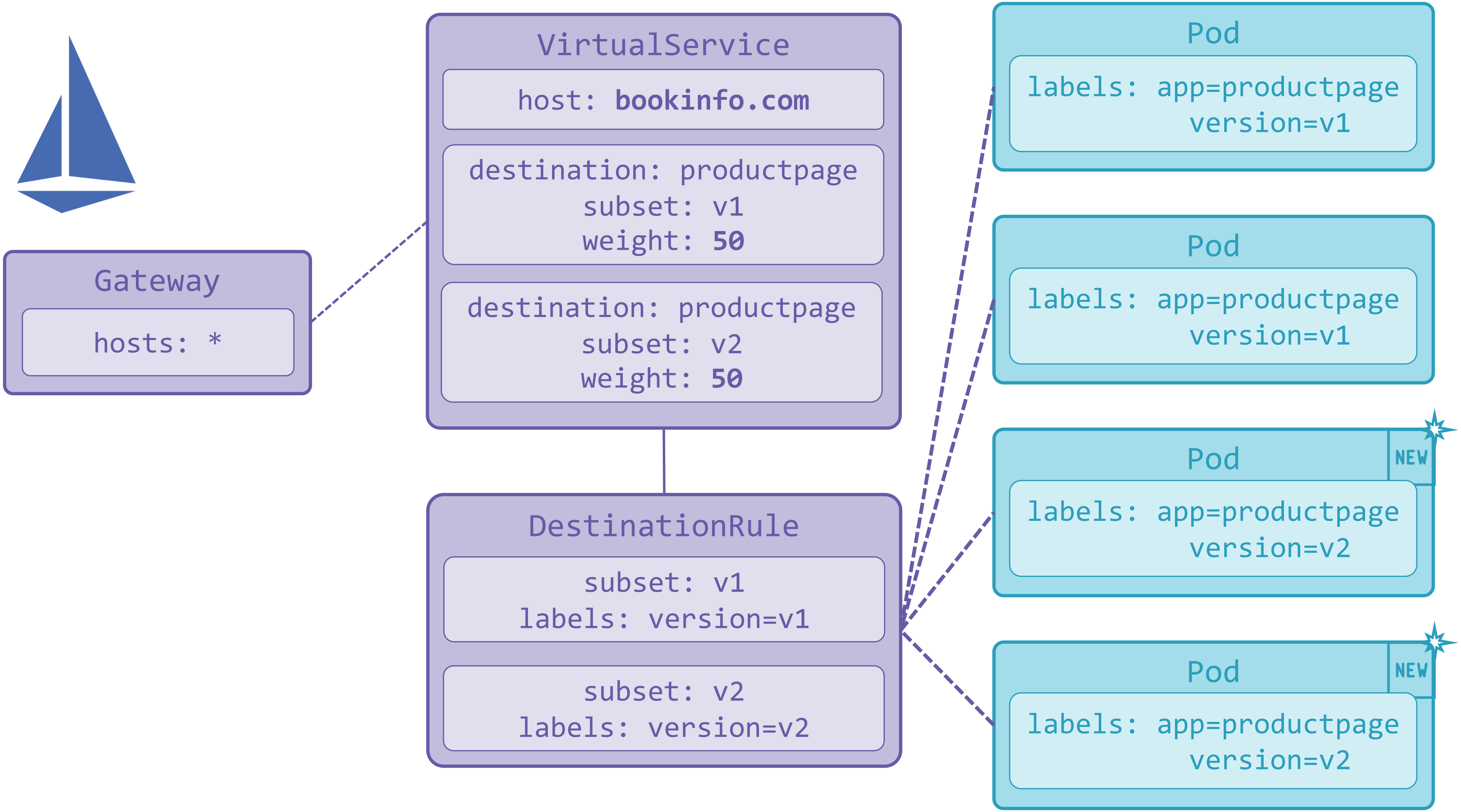
labels: app=productpage
version=v1

Pod NEW

labels: app=productpage
version=v2

Pod NEW

labels: app=productpage
version=v2



Gateway

hosts: *

VirtualService

host: **bookinfo.com**

destination: productpage
subset: v1
weight: **50**

destination: productpage
subset: v2
weight: **50**

DestinationRule

subset: v1
labels: version=v1

subset: v2
labels: version=v2

Pod

labels: app=productpage
version=v1

Pod

labels: app=productpage
version=v1

Pod

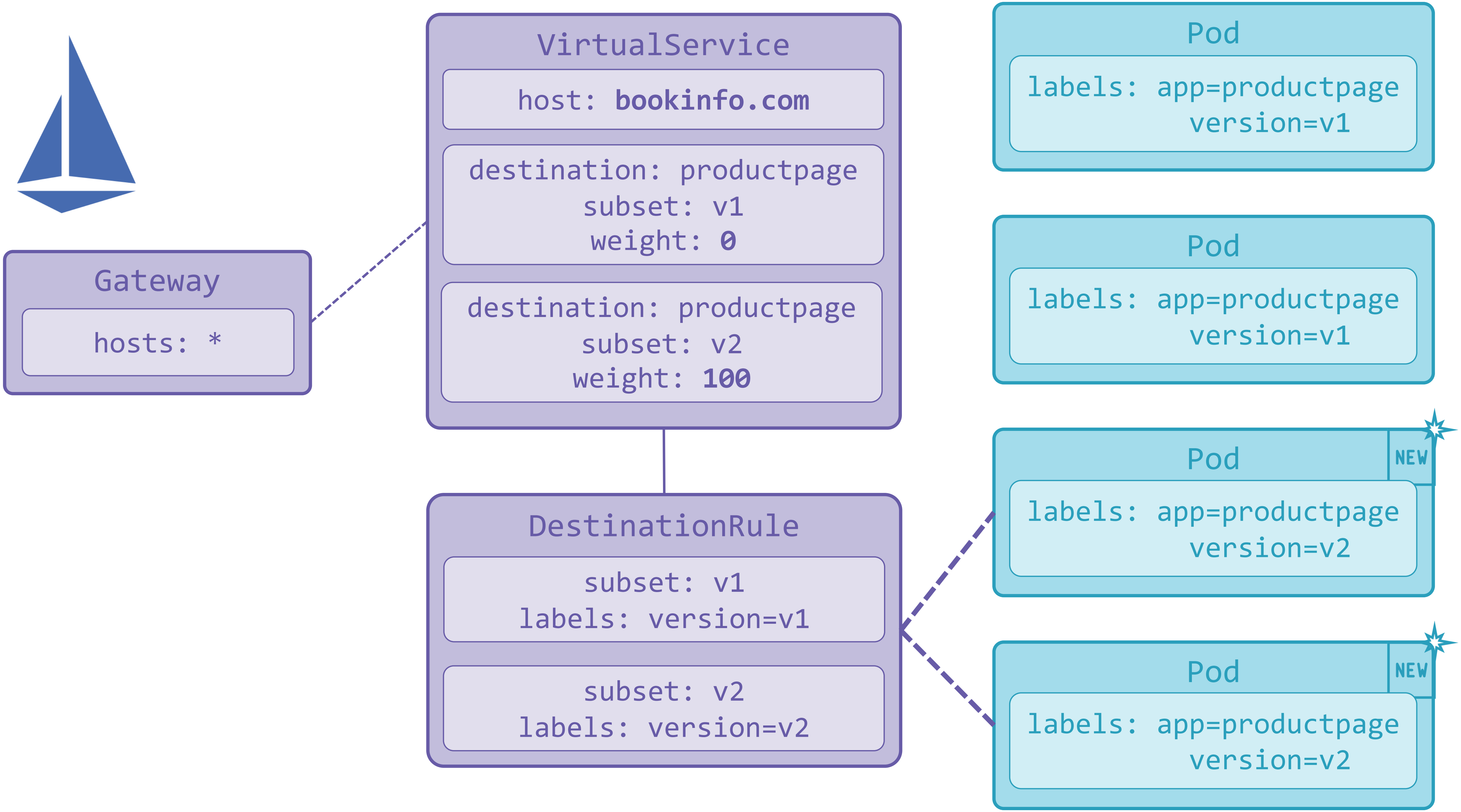
NEW

labels: app=productpage
version=v2

Pod

NEW

labels: app=productpage
version=v2



Gateway

hosts: *

VirtualService

host: **bookinfo.com**

destination: productpage
subset: v1
weight: **0**

destination: productpage
subset: v2
weight: **100**

DestinationRule

subset: v1
labels: version=v1

subset: v2
labels: version=v2

Pod

labels: app=productpage
version=v1

Pod

labels: app=productpage
version=v1

Pod NEW

labels: app=productpage
version=v2

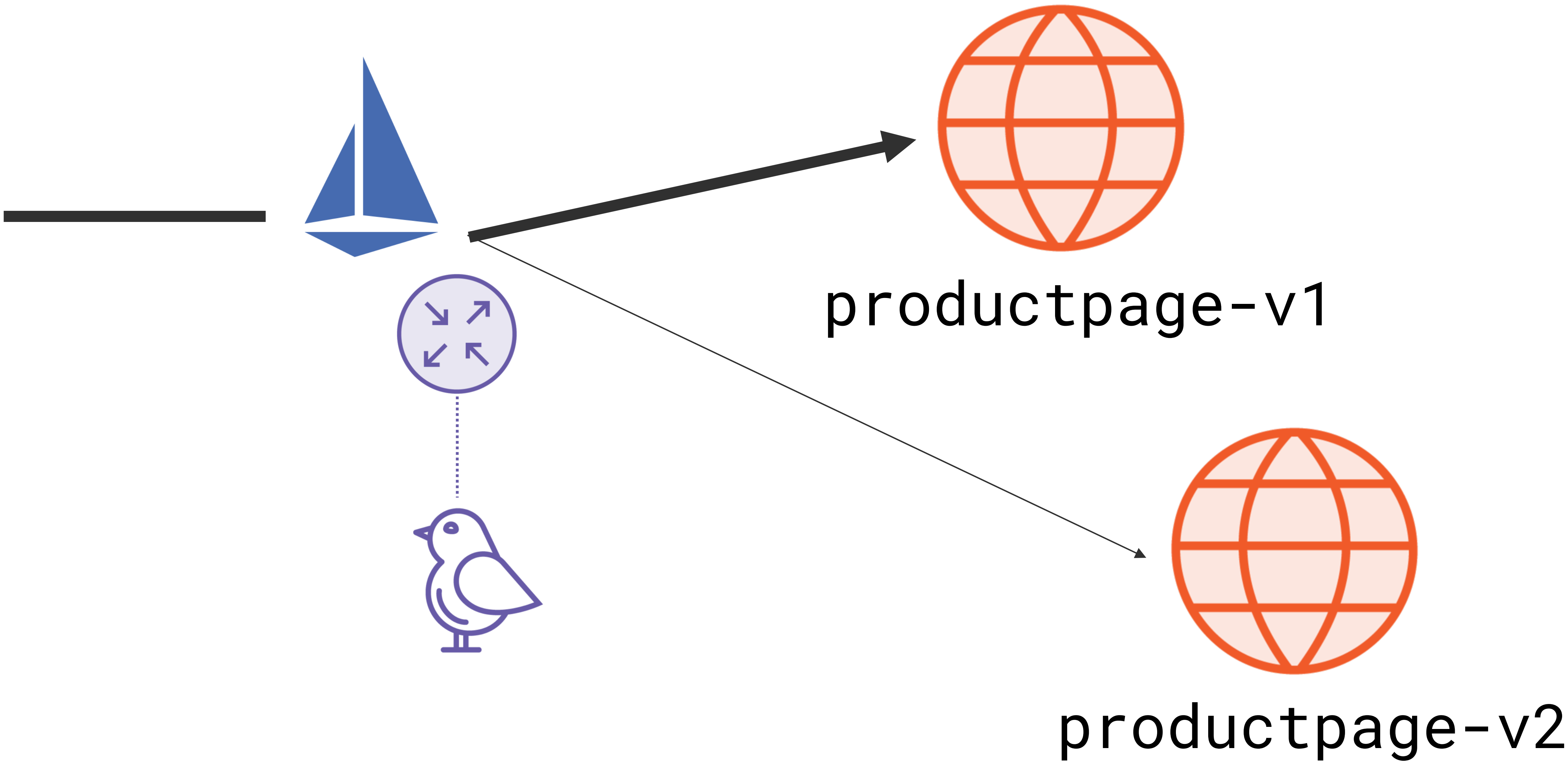
Pod NEW

labels: app=productpage
version=v2

Demo

Canary deployment

- Traffic weighted to v1
- Shift traffic to v2
- Canary with sticky sessions


productpage-v1
productpage-v2

Canary Deployment

VirtualService-70-30.yaml

```yaml
http:
  - route:
      - destination:
          host: productpage
          subset: v1
        weight: 70
      - destination:
          host: productpage
          subset: v2
        weight: 30
```

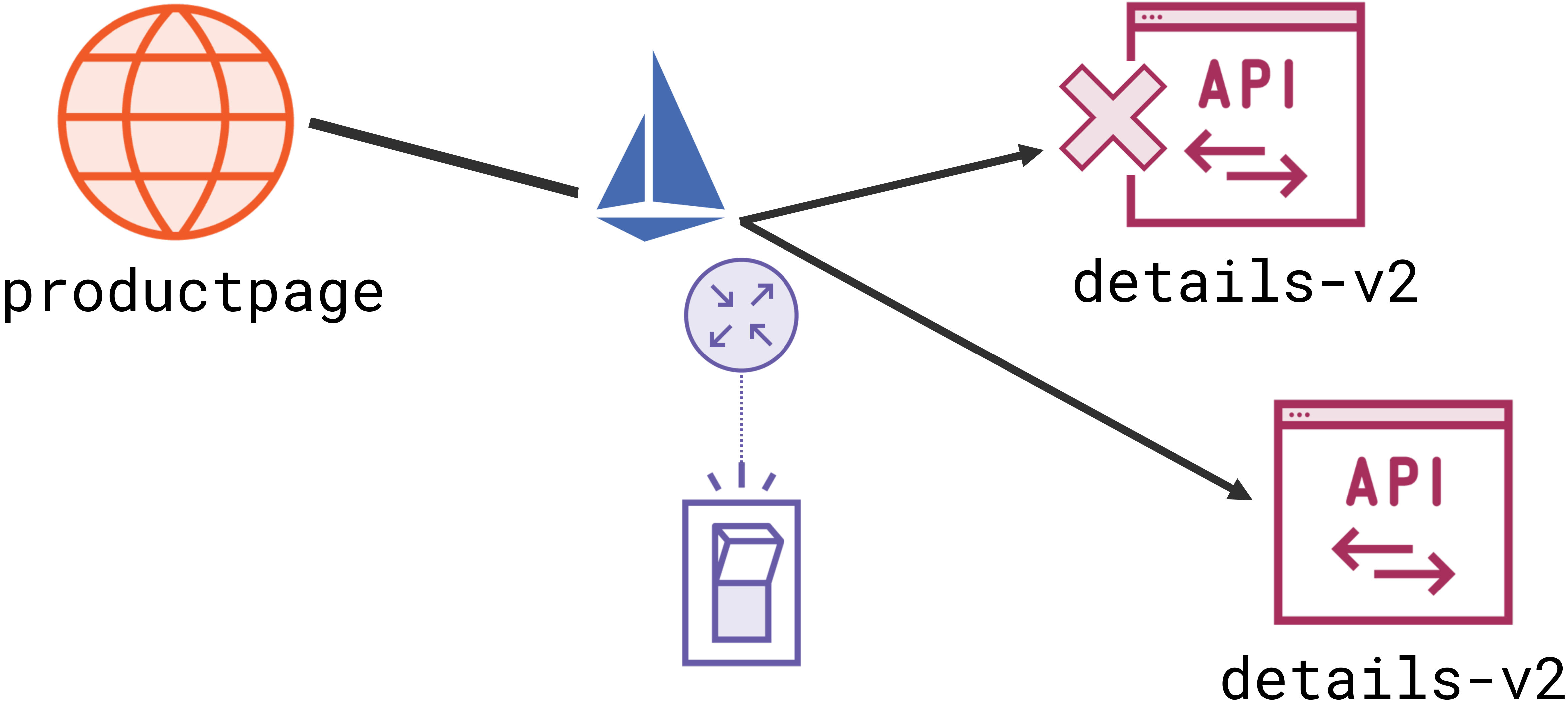
VirtualService-5-95.yaml

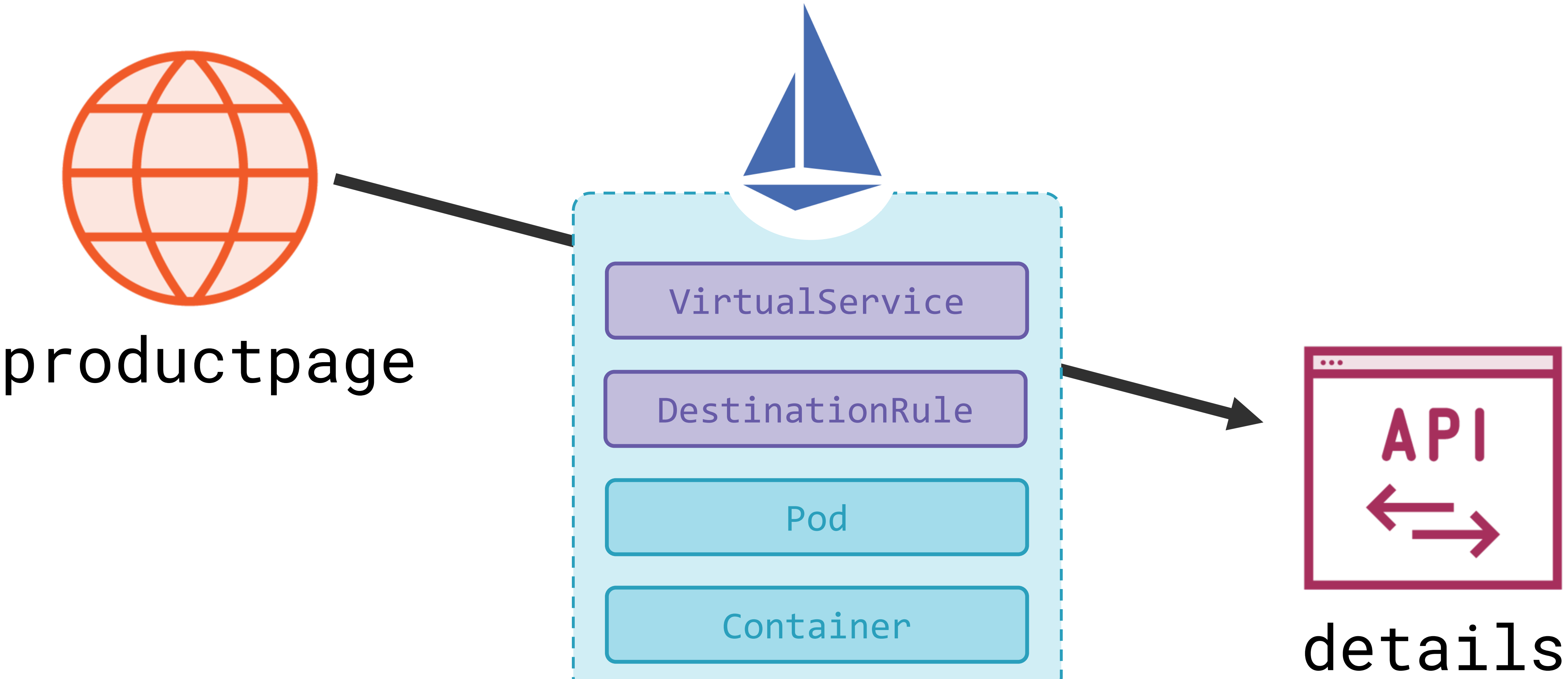
```yaml
http:
  - route:
      - destination:
          host: productpage
          subset: v1
        weight: 5
      - destination:
          host: productpage
          subset: v2
        weight: 95
```

Canary Deployment with Sticky Sessions

VirtualService.yaml

```yaml
http:
  - match:
      - headers:
          cookie:
            regex: "^(.*?;)?(product-page=v2)(;.*)?$"
    route:
      - destination:
          host: productpage
          subset: v2
  - route:
      - destination:
          host: productpage
          subset: v1
        weight: 70
      - destination:
          host: productpage
          subset: v2
        weight: 30
```


productpage
API
details-v2
API
details-v2



productpage

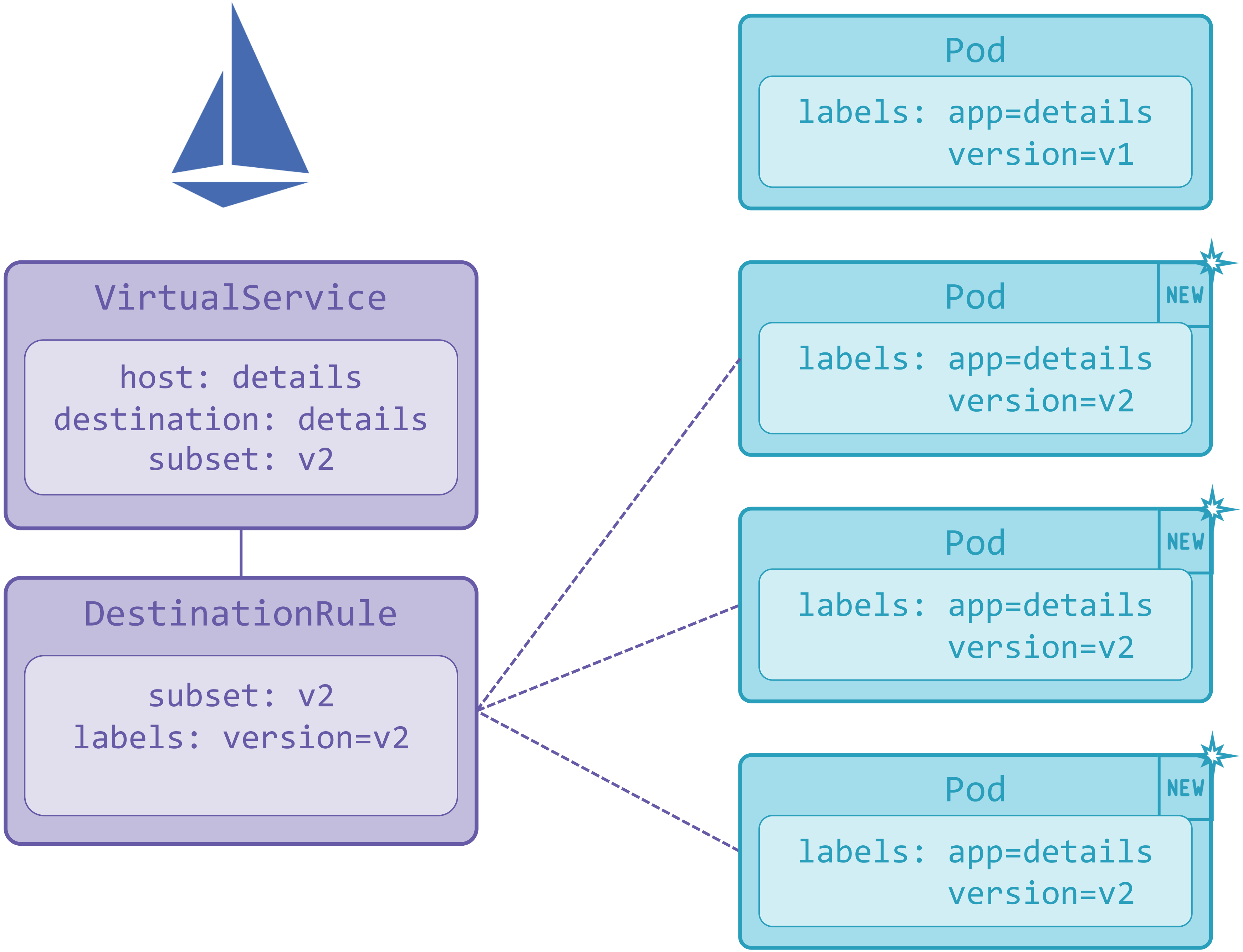
VirtualService

DestinationRule

Pod

Container

details



VirtualService

host: details
destination: details
subset: v2

DestinationRule

subset: v2
labels: version=v2

Pod

labels: app=details
version=v1

Pod NEW

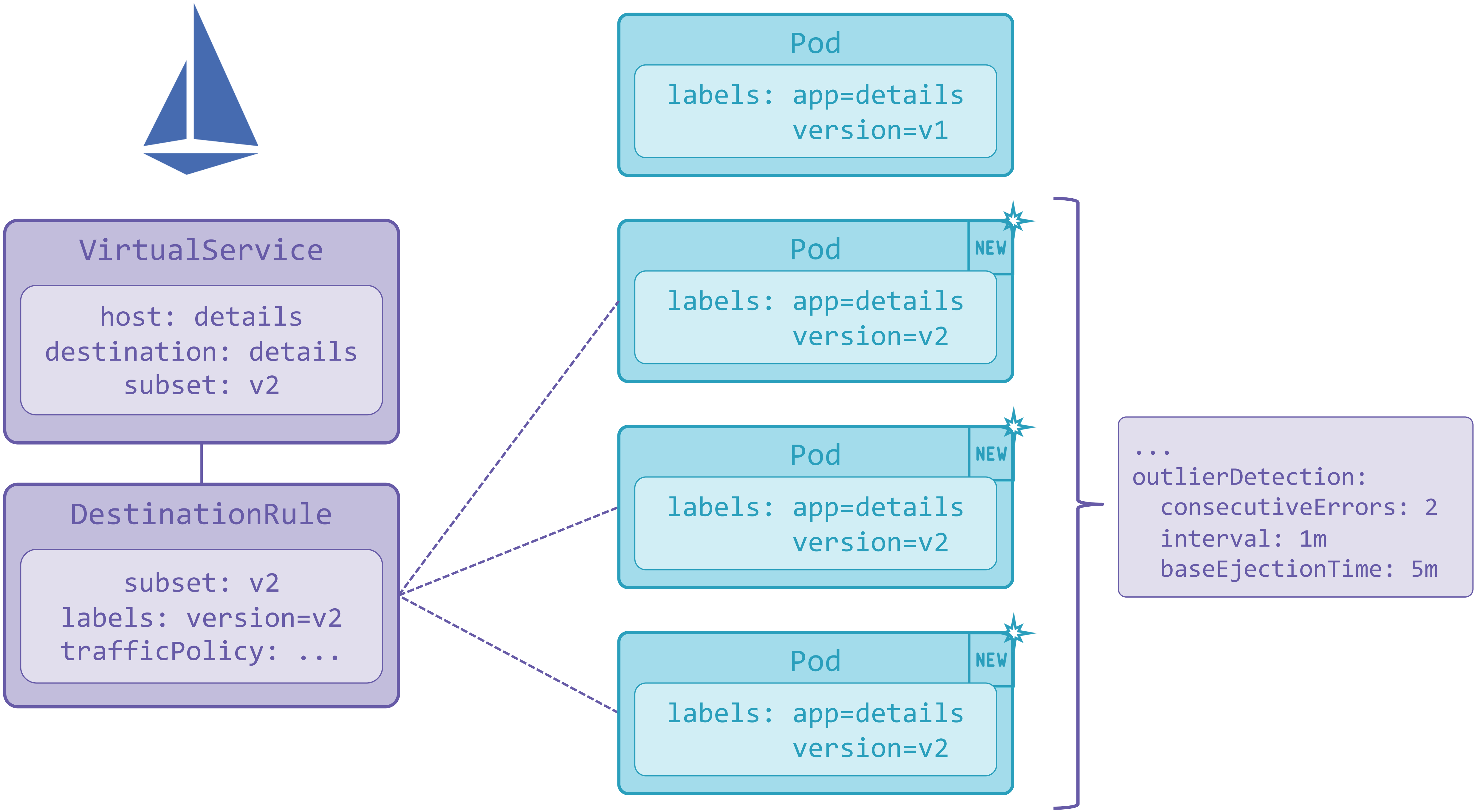
labels: app=details
version=v2

Pod NEW

labels: app=details
version=v2

Pod NEW

labels: app=details
version=v2



VirtualService

```
host: details
destination: details
subset: v2
```

DestinationRule

```
subset: v2
labels: version=v2
trafficPolicy: ...
```

Pod

```
labels: app=details
        version=v1
```

Pod

NEW

```
labels: app=details
        version=v2
```

Pod

NEW

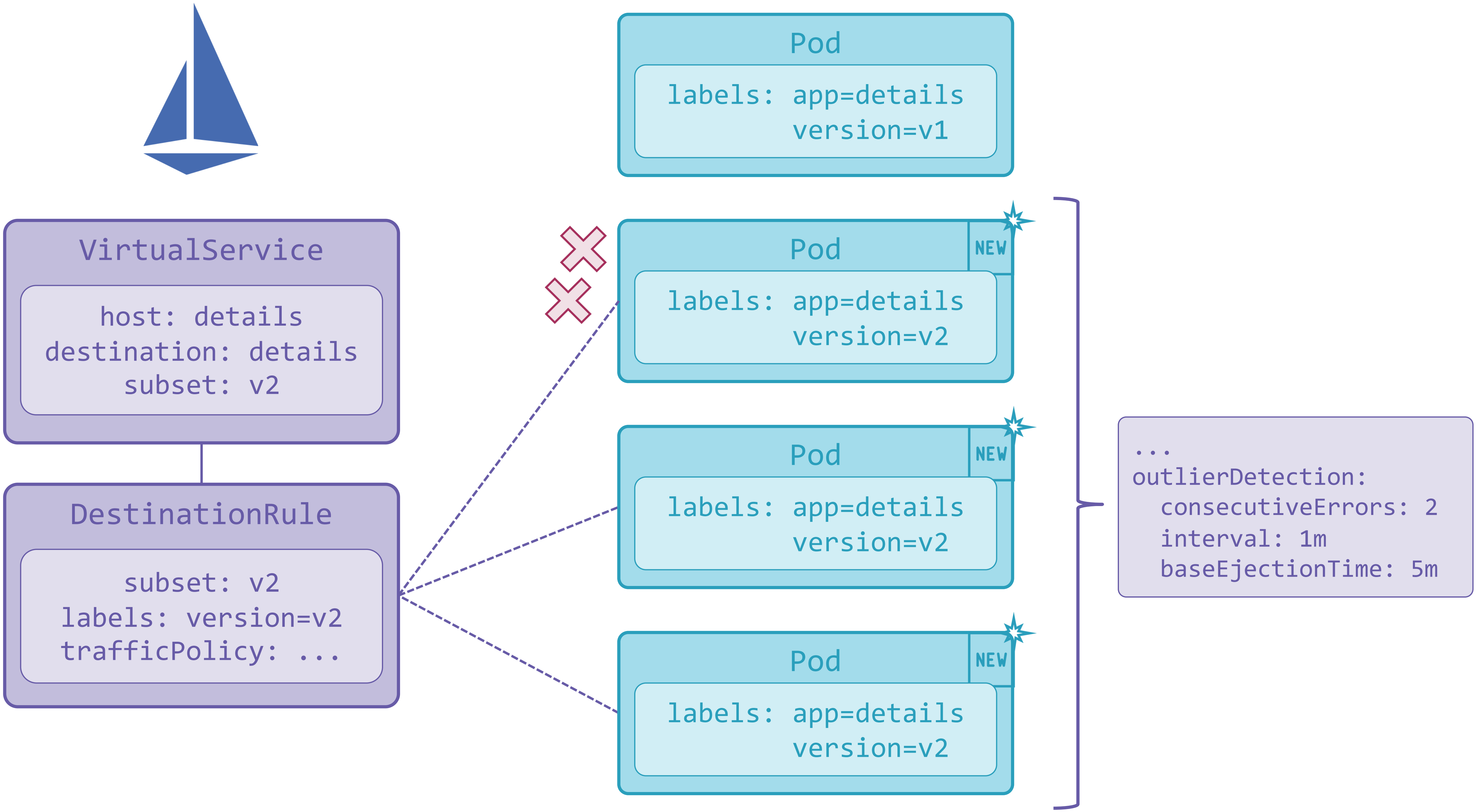
```
labels: app=details
        version=v2
```

Pod

NEW

```
labels: app=details
        version=v2
```

```
...
outlierDetection:
  consecutiveErrors: 2
  interval: 1m
  baseEjectionTime: 5m
```



VirtualService

host: details
destination: details
subset: v2

DestinationRule

subset: v2
labels: version=v2
trafficPolicy: ...

Pod

labels: app=details
version=v1

Pod

labels: app=details
version=v2

Pod

labels: app=details
version=v2

Pod

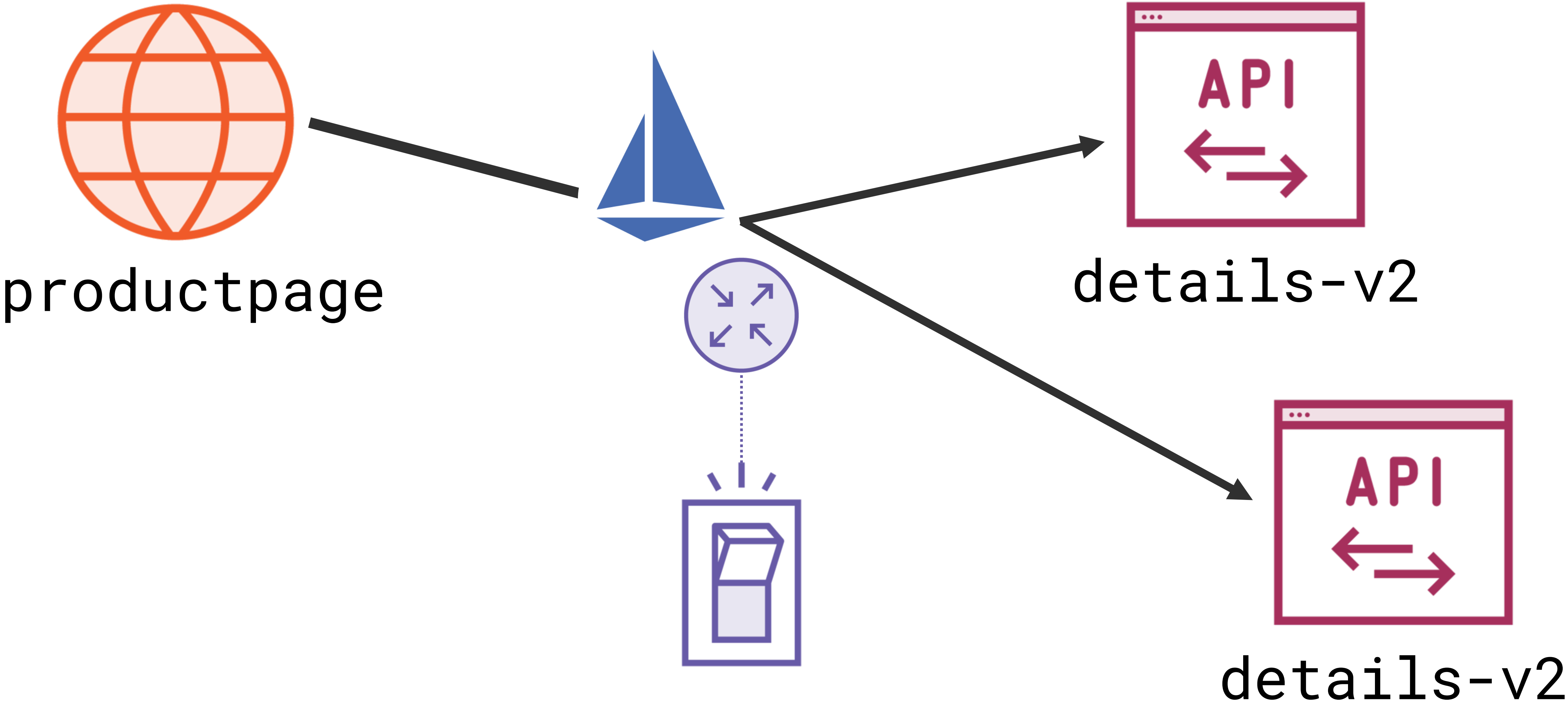
labels: app=details
version=v2

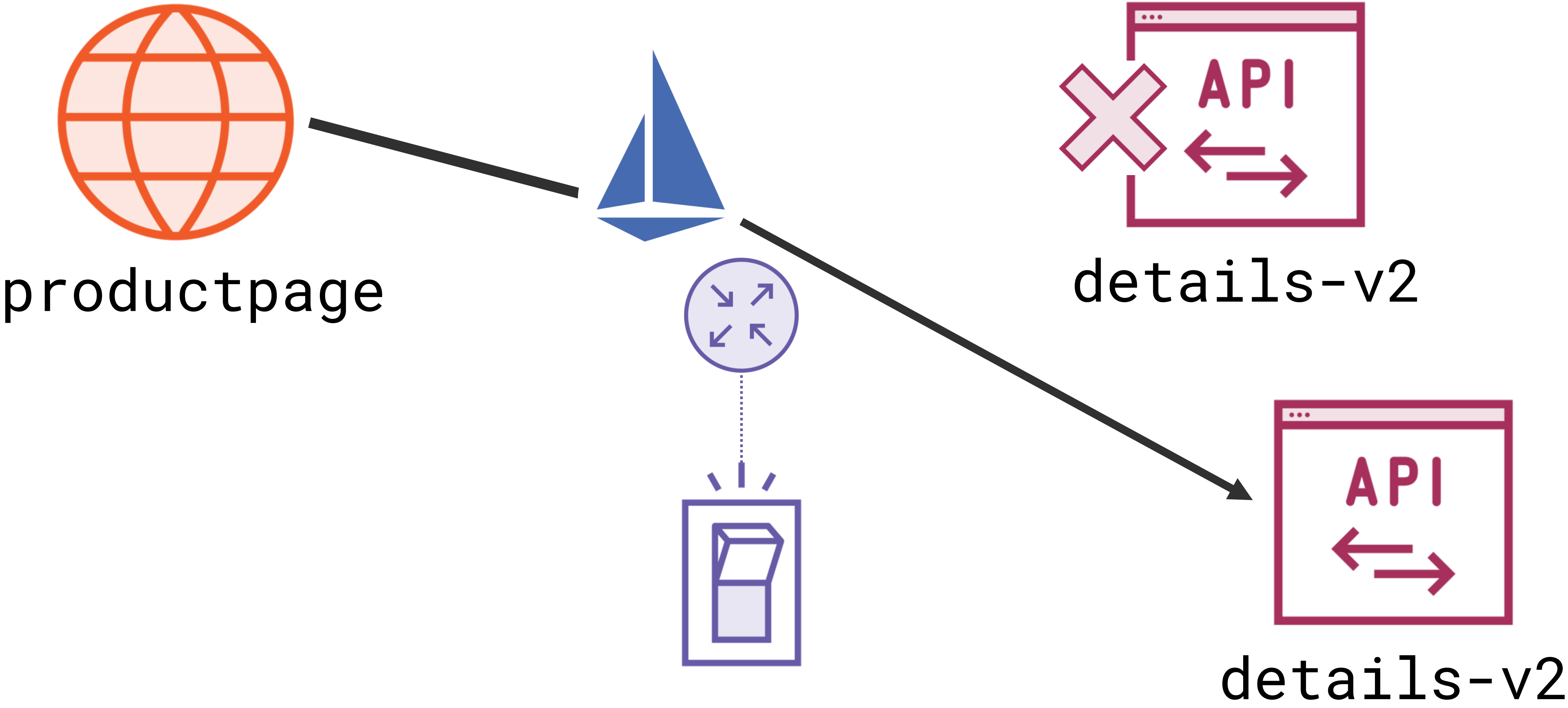
```
...
outlierDetection:
  consecutiveErrors: 2
  interval: 1m
  baseEjectionTime: 5m
```

Demo

Circuit breaker

- Deploy service update
- Failing instances
- Route with outlier detection


productpage
API
details-v2
API
details-v2


productpage
API
details-v2
API
details-v2

Circuit Breaker with Outlier Detection

DestinationRule.yaml

```yaml
spec:
  host: details
  subsets:
    - name: v1
      labels:
        version: v1
    - name: v2
      labels:
        version: v2
      trafficPolicy:
        outlierDetection:
          consecutiveErrors: 2
          interval: 1m
          baseEjectionTime: 5m
          maxEjectionPercent: 100
```

Summary

Managing traffic

- Gateway
- VirtualService
- DestinationRule

Deployment strategies

- Dark launch
- Blue/green
- Canary

Self-healing apps

- Circuit breaker

Up Next:
Securing Communication with Mutual TLS