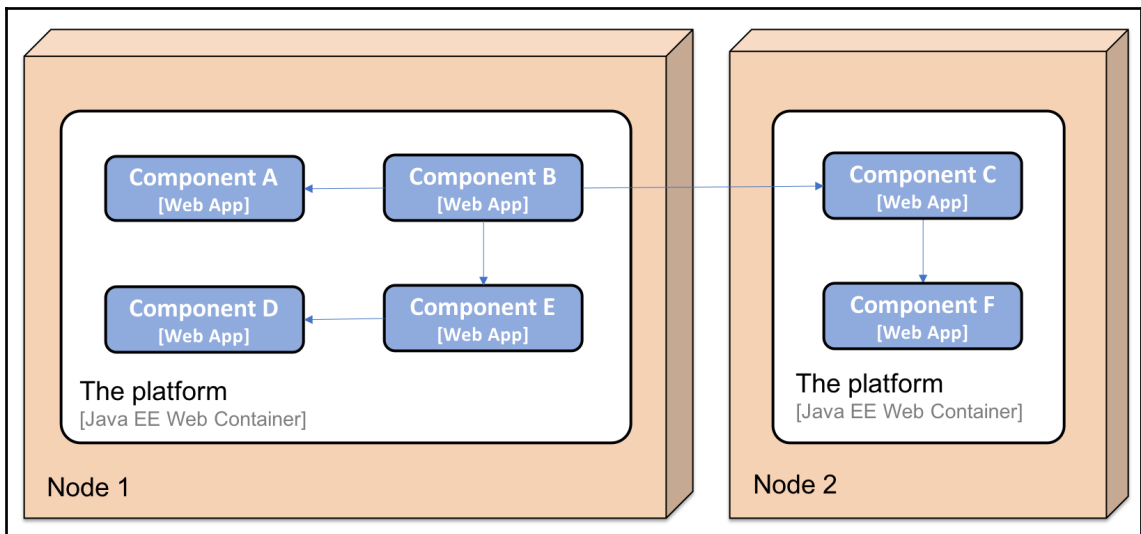
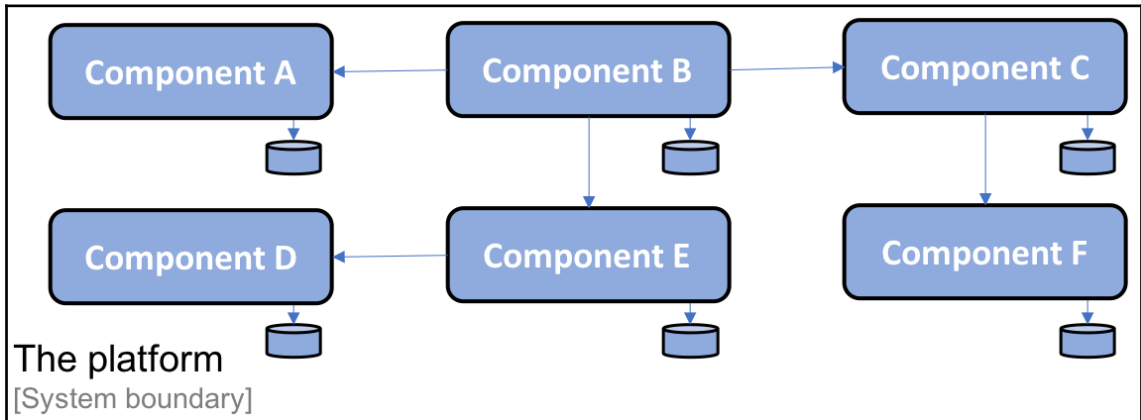
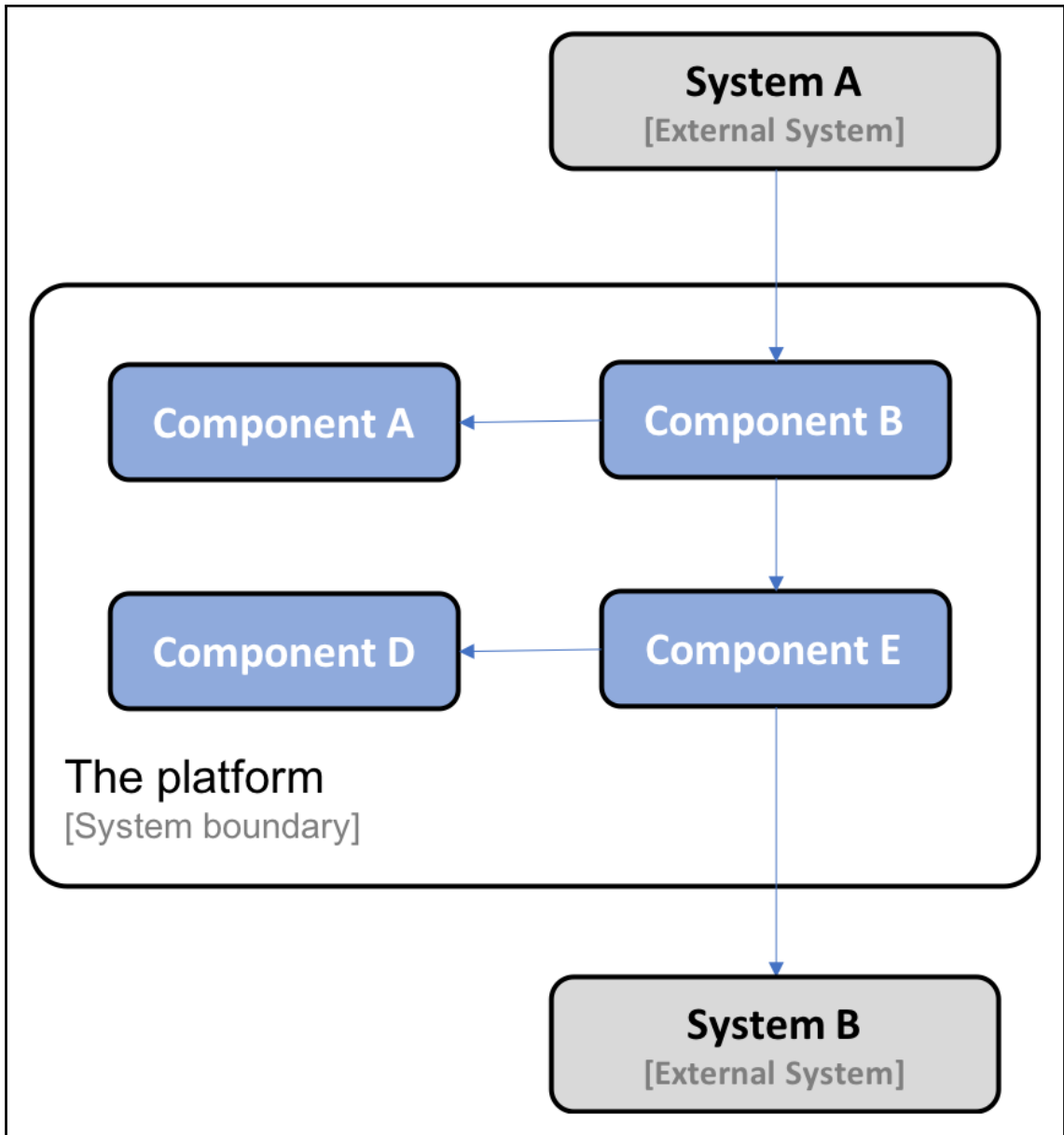
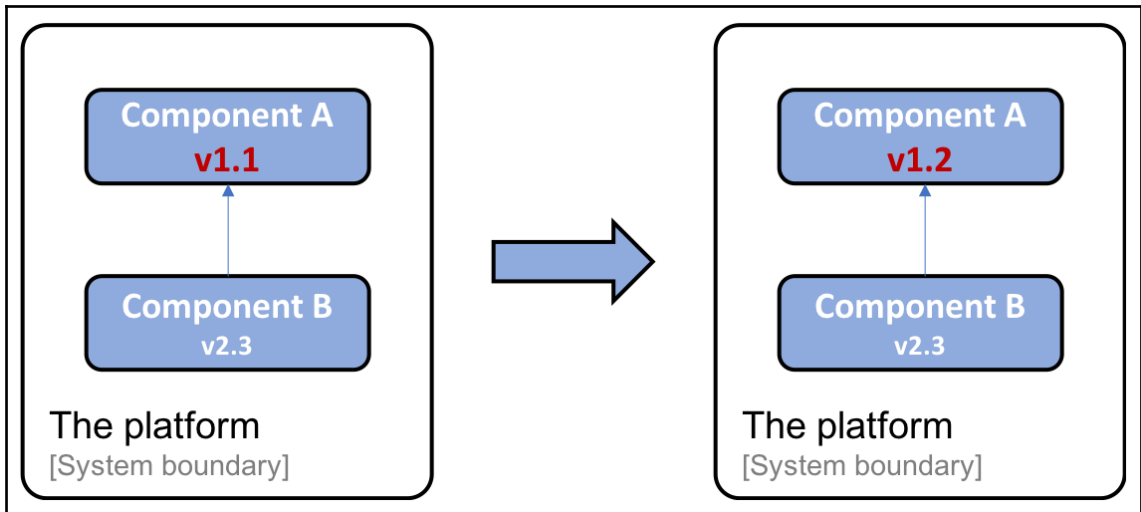
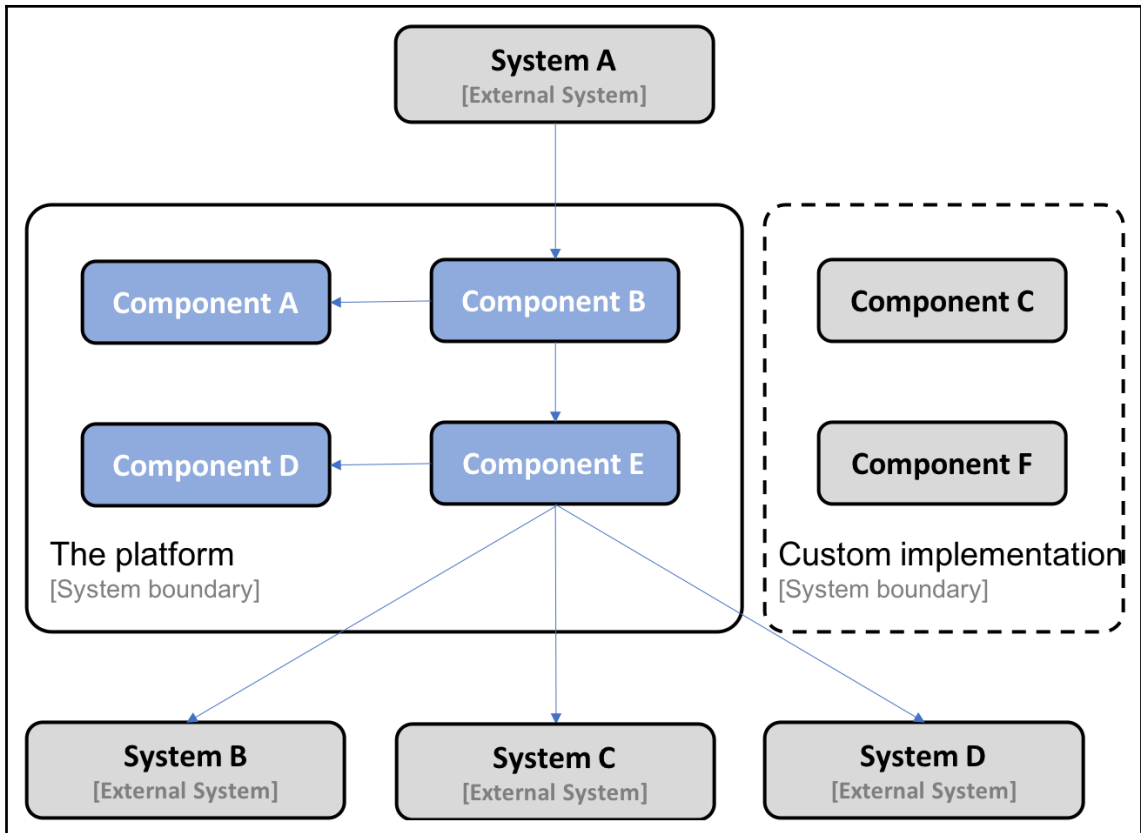
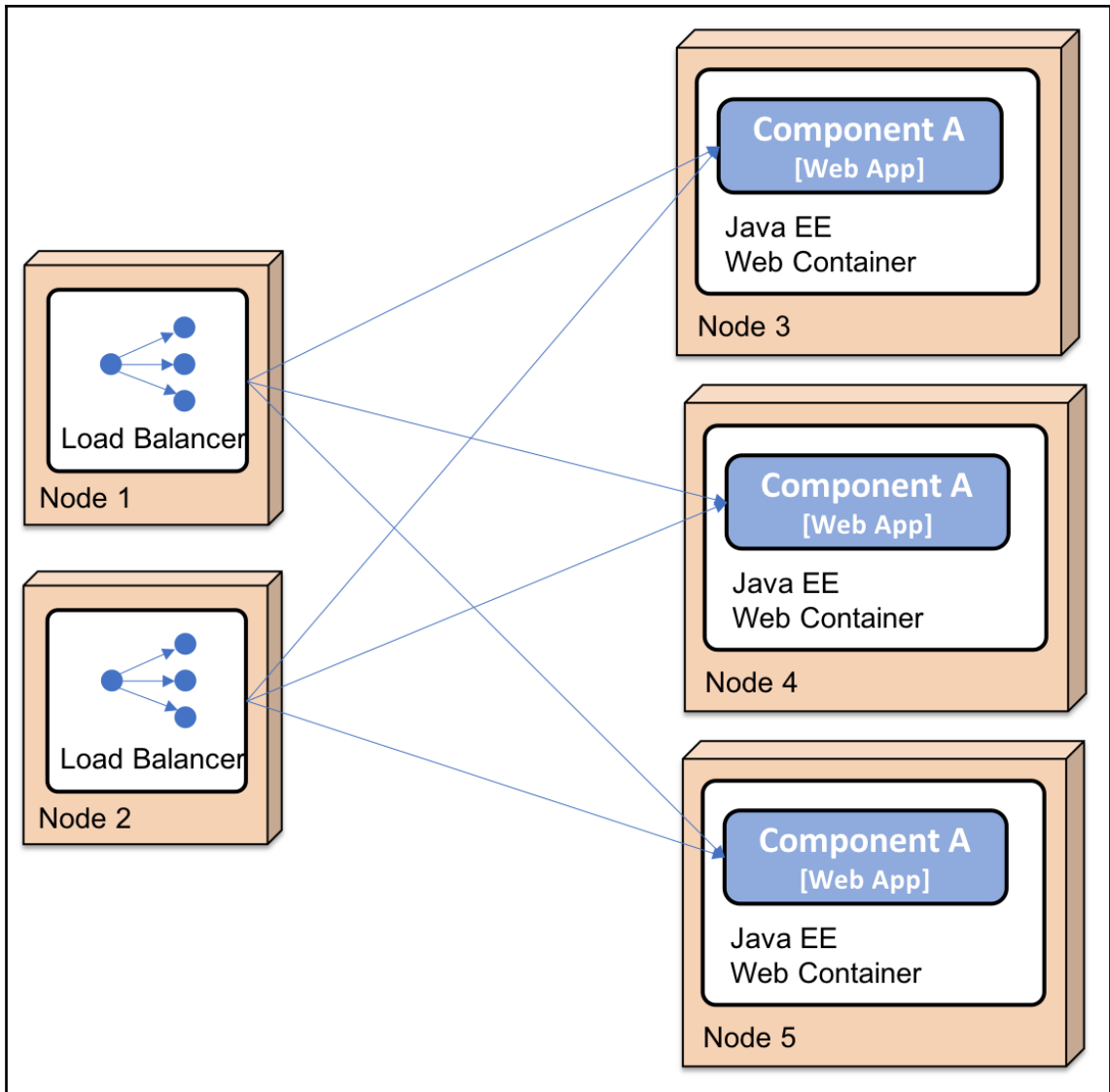


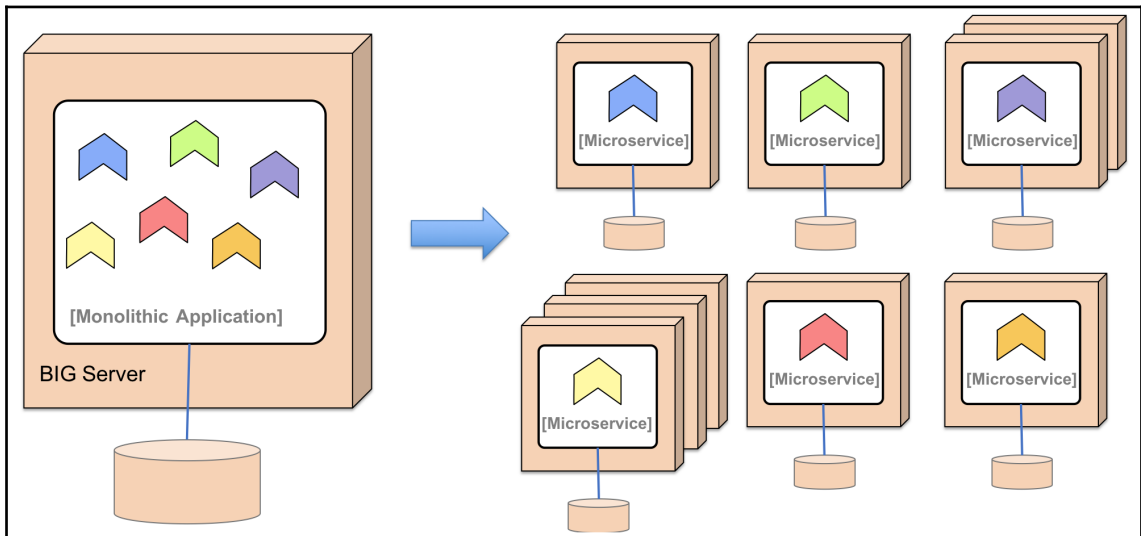
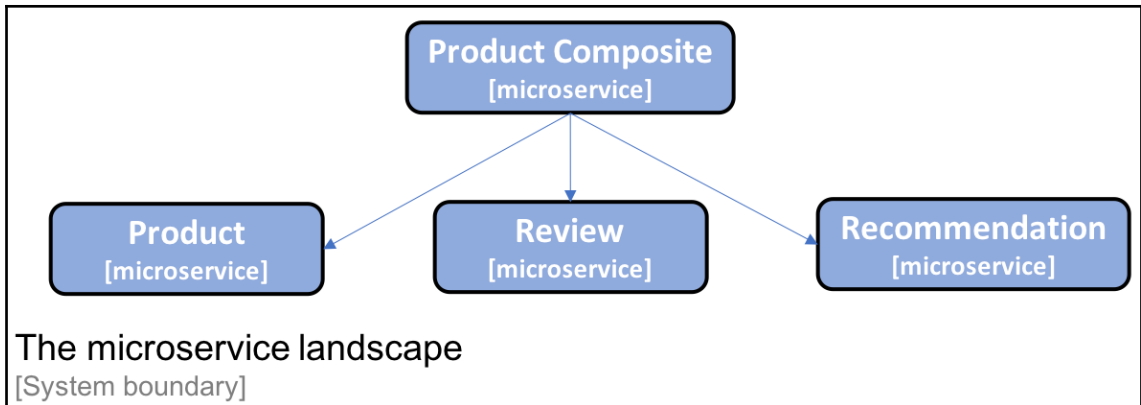
Chapter 1: Introduction to Microservices

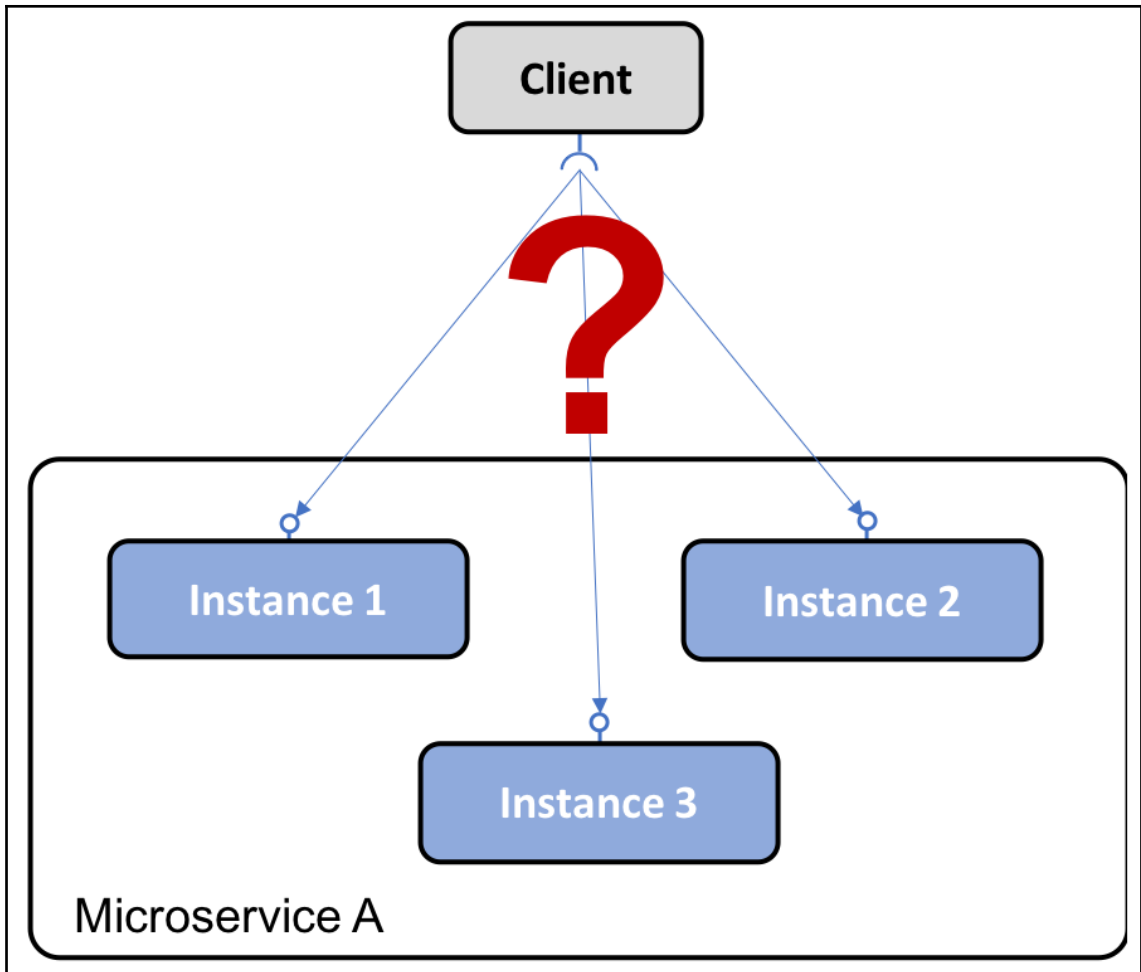


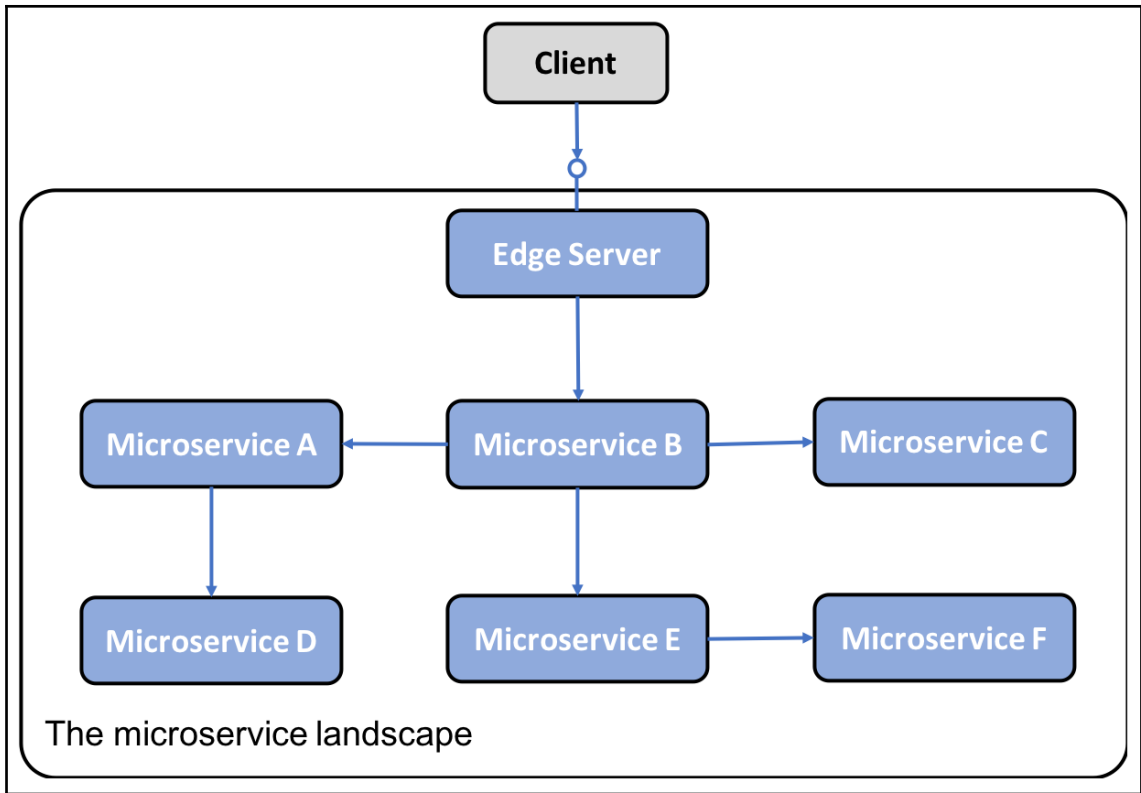


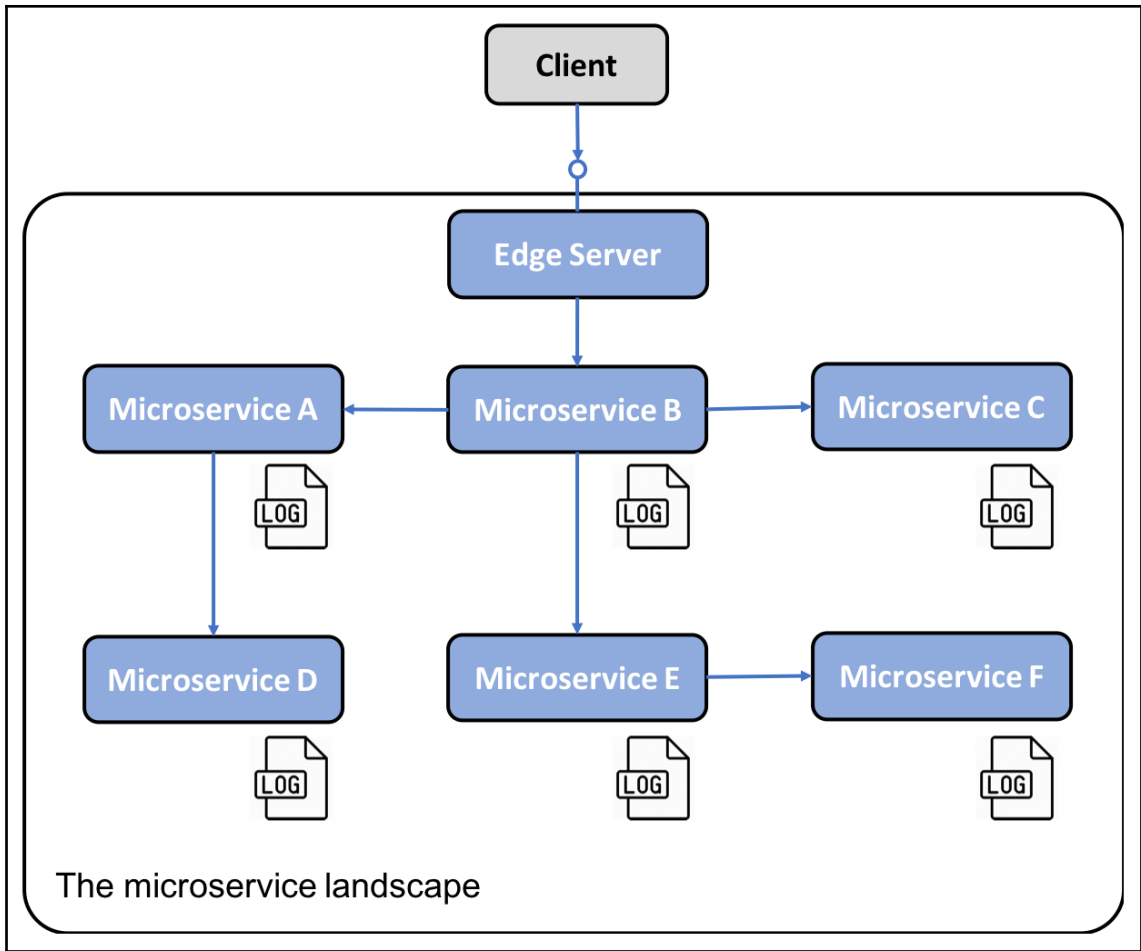


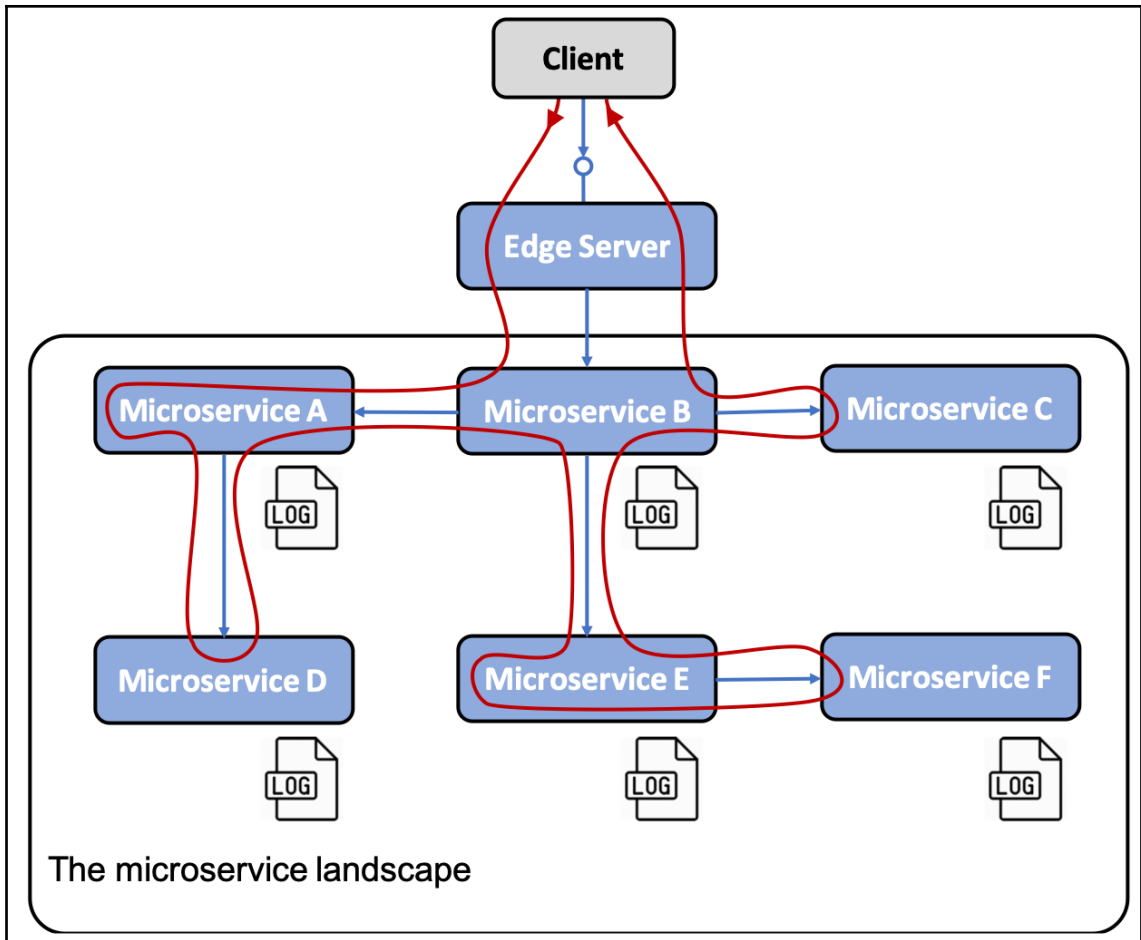


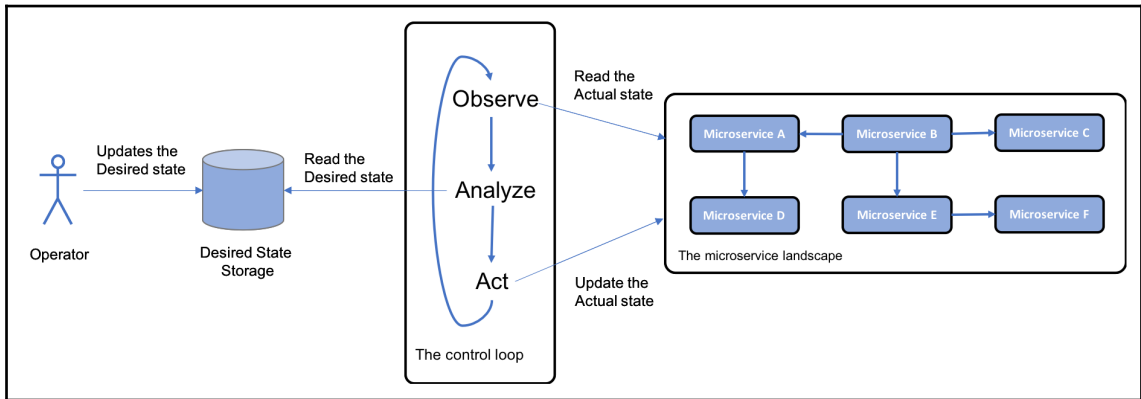
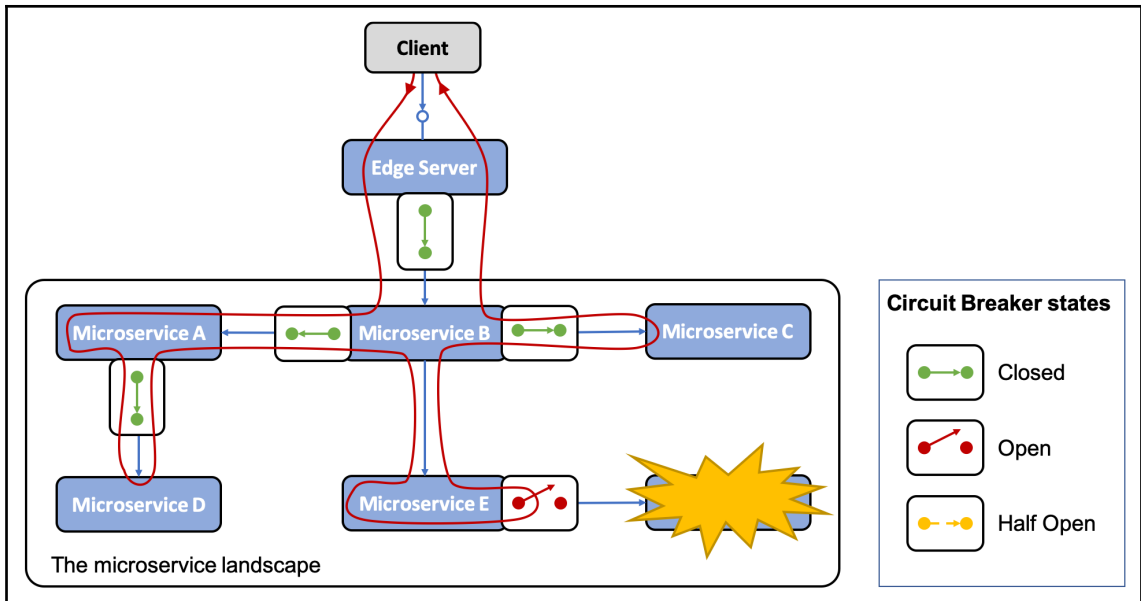


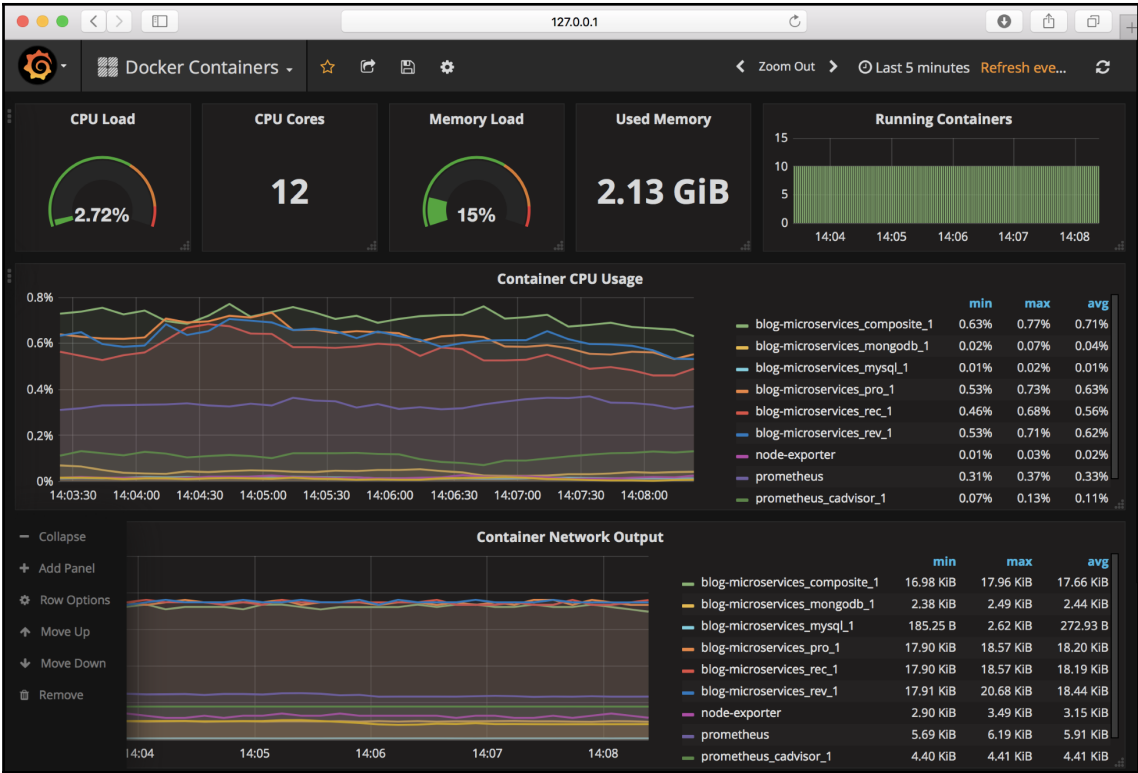












Chapter 2: Introduction to Spring Boot

The screenshot shows the Swagger UI in a web browser. The browser's address bar shows 'localhost'. The Swagger UI has a green header with the Swagger logo and a 'Select a spec' dropdown menu set to 'default'. The main content area displays 'Sample API' with a version badge '1.0.2'. Below the title, it shows the base URL 'localhost:7000/' and a link to 'http://localhost:7000/v2/api-docs'. A description of the API is provided, along with links for 'Terms of service' and 'License'. A section titled 'product-composite-service-impl' is expanded, showing a REST API for composite product information. The selected endpoint is a GET request to '/product-composite/{productId}' with the operation 'getProduct'. The 'Parameters' section is active, showing a required path parameter 'productId' of type 'integer(\$int32)'. A table lists the parameter details, including its name, description, and type. An 'Execute' button is visible below the parameters. The 'Responses' section is at the bottom, showing the response content type as 'application/json'.

swagger Select a spec default

Sample API 1.0.2

[Base URL: localhost:7000/]
<http://localhost:7000/v2/api-docs>

Description of the API
[Terms of service](#)
[License](#)

product-composite-service-impl REST API for composite product information. ▾

GET /product-composite/{productId} getProduct

Parameters Cancel

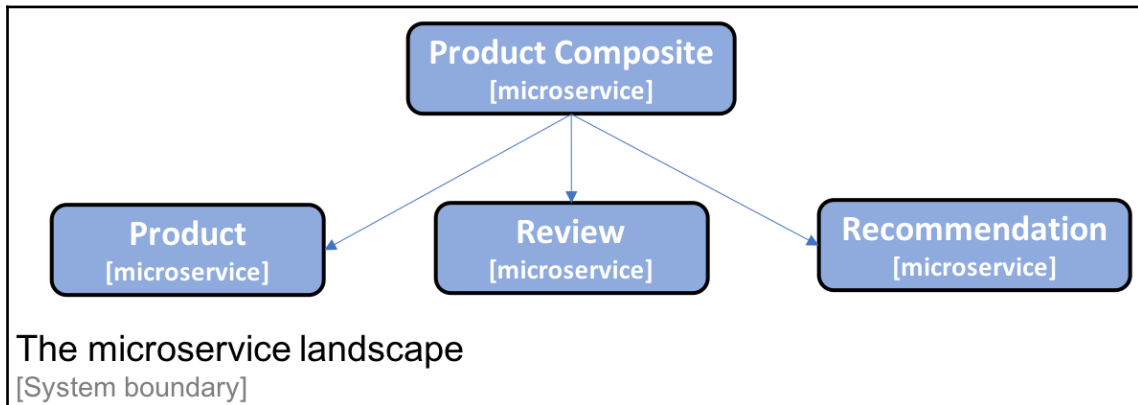
Name	Description
productId * required integer(\$int32) (path)	productId productId - productId

Execute

Responses Response content type **application/json** ▾

Chapter 3: Creating a Set of Cooperating Microservices

```
6. @b394afed9384:/ (bash)
git version 2.17.1 (Apple Git-112)
openjdk version "11" 2018-09-25
curl 7.54.0 ...
jq-1.5
Spring CLI v2.0.5.RELEASE
```



```
4. bash
$ find microservices/product-service -type f
microservices/product-service/gradle/wrapper/gradle-wrapper.jar
microservices/product-service/gradle/wrapper/gradle-wrapper.properties
microservices/product-service/gradlew
microservices/product-service/.gitignore
microservices/product-service/build.gradle
microservices/product-service/gradlew.bat
microservices/product-service/settings.gradle
microservices/product-service/src/test/java/se/magnus/microservices/core/product/ProductServiceApplicationTests.java
microservices/product-service/src/main/resources/application.properties
microservices/product-service/src/main/java/se/magnus/microservices/core/product/ProductServiceApplication.java
$
```



```
4. bash
...Started ProductCompositeServiceApplication...
...Started RecommendationServiceApplication...
...Started ProductServiceApplication...
...Started ReviewServiceApplication...
```

```
4. bash
$ curl http://localhost:7000/product-composite/1
{"productId":1,"name":"name-1","weight":123,"recommendations":[{"recommendationId":1,"author":"Author 1","rate":1}, {"recommendationId":2,"author":"Author 2","rate":2}, {"recommendationId":3,"author":"Author 3","rate":3}], "reviews":[{"reviewId":1,"author":"Author 1","subject":"Subject 1"}, {"reviewId":2,"author":"Author 2","subject":"Subject 2"}, {"reviewId":3,"author":"Author 3","subject":"Subject 3"}], "serviceAddresses":{"cmp":"Magnus-MBP32.lan/192.168.1.185:7000", "pro":"Magnus-MBP32.lan/192.168.1.185:7001", "rev":"Magnus-MBP32.lan/192.168.1.185:7003", "rec":"Magnus-MBP32.lan/192.168.1.185:7002"}}$
```

```
4. bash
$ curl http://localhost:7000/product-composite/1 -s | jq .
{
  "productId": 123,
  ...
  "recommendations": [ ... ],
  "reviews": [ ... ],
  "serviceAddresses": { ... }
}
$
```

product-composite-service - ProductCompositeServiceApplication [Spring Boot App] /Library/Java/JavaVirtualMachines/jdk1.8.0_181.jdk/Contents/Home

```

:: Spring Boot :: (v2.0.4.RELEASE)

2018-10-15 17:38:19.638 INFO 52138 --- [main] m.c.p.ProductCompositeServiceApplication : Starting P
2018-10-15 17:38:19.641 DEBUG 52138 --- [main] m.c.p.ProductCompositeServiceApplication : Running wi
2018-10-15 17:38:19.642 INFO 52138 --- [main] m.c.p.ProductCompositeServiceApplication : No active
2018-10-15 17:38:19.891 INFO 52138 --- [main] onfigReactiveWebServerApplicationContext : Refreshing
2018-10-15 17:38:20.900 INFO 52138 --- [main] s.w.r.r.m.a.RequestMappingHandlerMapping : Mapped "{/
2018-10-15 17:38:20.901 INFO 52138 --- [main] s.w.r.r.m.a.RequestMappingHandlerMapping : Mapped "{/
2018-10-15 17:38:20.902 INFO 52138 --- [main] s.w.r.r.m.a.RequestMappingHandlerMapping : Mapped "{/
2018-10-15 17:38:20.904 INFO 52138 --- [main] s.w.r.r.m.a.RequestMappingHandlerMapping : Mapped "{/
2018-10-15 17:38:20.955 INFO 52138 --- [main] o.s.w.r.handler.SimpleUrlHandlerMapping : Mapped URL
2018-10-15 17:38:20.955 INFO 52138 --- [main] o.s.w.r.handler.SimpleUrlHandlerMapping : Mapped URL
2018-10-15 17:38:21.347 INFO 52138 --- [main] o.s.b.a.e.web.EndpointLinksResolver : Exposing 2
2018-10-15 17:38:21.364 INFO 52138 --- [main] .b.a.e.w.r.WebFluxEndpointHandlerMapping : Mapped "{/
2018-10-15 17:38:21.364 INFO 52138 --- [main] .b.a.e.w.r.WebFluxEndpointHandlerMapping : Mapped "{/
2018-10-15 17:38:21.367 INFO 52138 --- [main] .b.a.e.w.r.WebFluxEndpointHandlerMapping : Mapped "{/
2018-10-15 17:38:21.483 INFO 52138 --- [main] o.s.w.r.r.m.a.ControllerMethodResolver : Looking fo

```

Run Dashboard: ProductCompositeServiceApplication (1)

```

:: Spring Boot :: (v2.0.4.RELEASE)

2018-10-15 17:33:00.657 INFO 50983 --- [main] m.c.p.ProductCompositeServiceApplication : Starting Prod
2018-10-15 17:33:00.660 DEBUG 50983 --- [main] m.c.p.ProductCompositeServiceApplication : Running with
2018-10-15 17:33:00.661 INFO 50983 --- [main] m.c.p.ProductCompositeServiceApplication : No active pro
2018-10-15 17:33:00.719 INFO 50983 --- [main] onfigReactiveWebServerApplicationContext : Refreshing or
2018-10-15 17:33:02.048 INFO 50983 --- [main] s.w.r.r.m.a.RequestMappingHandlerMapping : Mapped "{/pr
2018-10-15 17:33:02.106 INFO 50983 --- [main] o.s.w.r.handler.SimpleUrlHandlerMapping : Mapped URL pa
2018-10-15 17:33:02.106 INFO 50983 --- [main] o.s.w.r.handler.SimpleUrlHandlerMapping : Mapped URL pa
2018-10-15 17:33:02.539 INFO 50983 --- [main] o.s.b.a.e.web.EndpointLinksResolver : Exposing 2 en
2018-10-15 17:33:02.548 INFO 50983 --- [main] .b.a.e.w.r.WebFluxEndpointHandlerMapping : Mapped "{/act
2018-10-15 17:33:02.549 INFO 50983 --- [main] .b.a.e.w.r.WebFluxEndpointHandlerMapping : Mapped "{/act
2018-10-15 17:33:02.550 INFO 50983 --- [main] .b.a.e.w.r.WebFluxEndpointHandlerMapping : Mapped "{/act

```

```

6. @b394afed9384:/ (bash)

$ java -jar inetTester/bin/inetTester.jar
Calling the hostname resolution method...
Method called, hostname Magnuss-Mac.local, elapsed time: 5010 (ms)
$

```

```

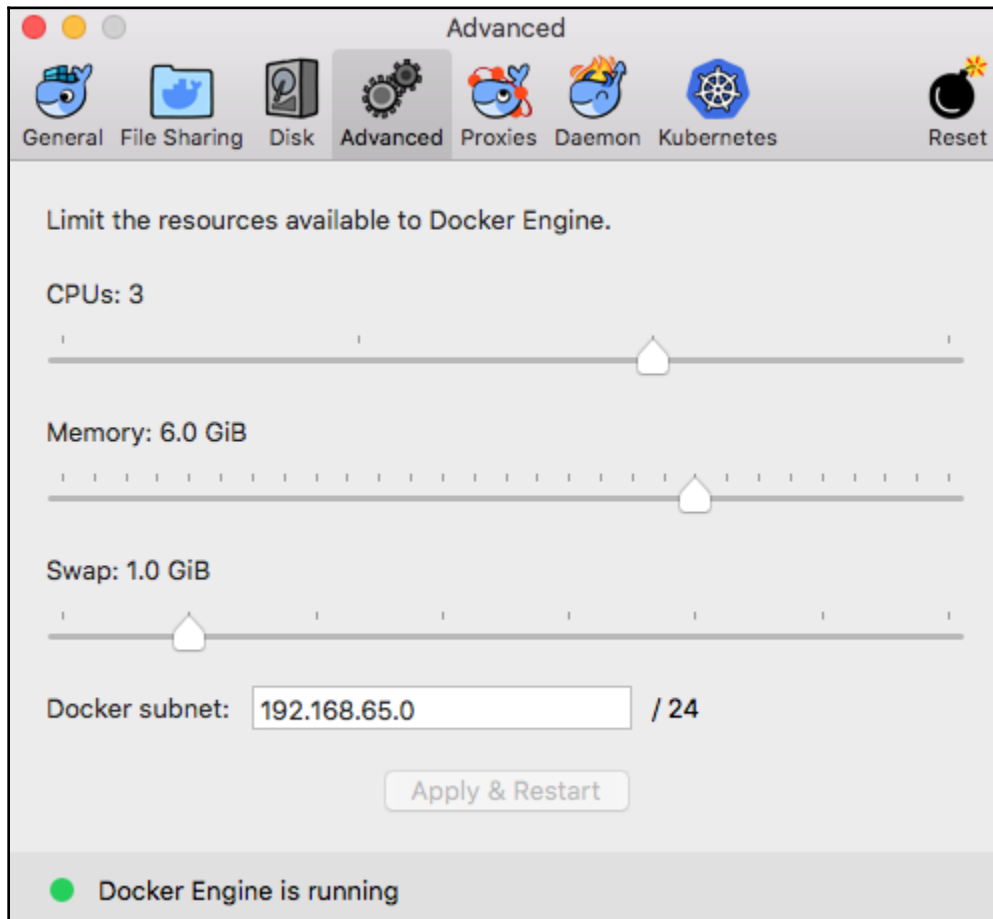
6. @b394afed9384:/ (bash)

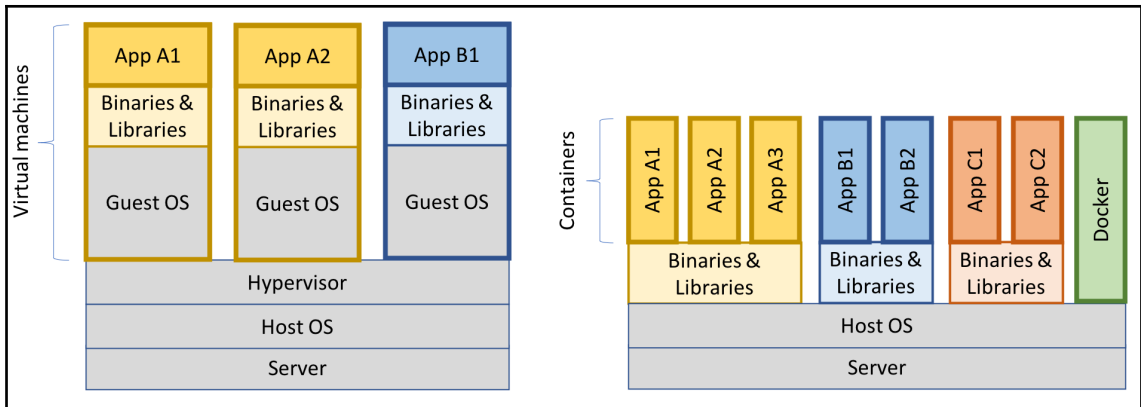
$ java -jar inetTester/bin/inetTester.jar
Calling the hostname resolution method...
Method called, hostname Magnuss-Mac.local, elapsed time: 9 (ms)
$

```

```
6. @b394afed9384:/ (bash)
$ ./test-em-all.bash
Test OK (HTTP Code: 200)
Test OK (actual value: 1)
Test OK (actual value: 3)
Test OK (actual value: 3)
Test OK (HTTP Code: 404, {"timestamp":"2018-10-18T14:00:49.62+02:00","path":"/product-composite/13","message":"No product found for productId: 13","status":404,"error":"Not Found"})
Test OK (HTTP Code: 200)
Test OK (actual value: 113)
Test OK (actual value: 0)
Test OK (actual value: 3)
Test OK (HTTP Code: 200)
Test OK (actual value: 213)
Test OK (actual value: 3)
Test OK (actual value: 0)
Test OK (HTTP Code: 422, {"timestamp":"2018-10-18T14:00:49.811+02:00","path":"/product-composite/-1","message":"Invalid productId: -1","status":422,"error":"Unprocessable Entity"})
Test OK (actual value: "Invalid productId: -1")
Test OK (HTTP Code: 400, {"timestamp":"2018-10-18T12:00:49.858+0000","path":"/product-composite/invalidProductId","status":400,"error":"Bad Request","message":"Type mismatch."})
Test OK (actual value: "Type mismatch.")
$ █
```

Chapter 4: Deploying Our Microservices Using Docker





```
4. root@435dc56d39f6: / (docker)
$ docker run -it --rm ubuntu
root@435dc56d39f6: /#
```

```
4. root@435dc56d39f6: / (docker)
root@435dc56d39f6: /# cat /etc/os-release | grep 'VERSION='
VERSION="18.04.3 LTS (Bionic Beaver)"
root@435dc56d39f6: /#
```

```
4. @700dd0df9ffe:/ (docker)
$ docker run --rm -it centos
[root@700dd0df9ffe /]# cat /etc/redhat-release
CentOS Linux release 7.6.1810 (Core)
[root@700dd0df9ffe /]#
```

```
4. @700dd0df9ffe:/ (bash)
$ echo 'Runtime.getRuntime().availableProcessors()' | jshell -q
jshell> Runtime.getRuntime().availableProcessors()$1 ==> 12
$
```

```
4. @700dd0df9ffe:/ (bash)
$ java -XX:+PrintFlagsFinal -version | grep MaxHeapSize
size_t MaxHeapSize = 8589934592 {product} {ergonomic}
...
$
```

```
6. @b394afed9384:/ (bash)
$ ls -l microservices/product-service/build/libs
-rw-r--r-- 1 magnus staff 19618829 Aug 30 18:59 product-service-1.0.0-SNAPSHOT.jar
$
```

```
4. @700dd0df9ffe:/ (bash)
$ docker images | grep product-service
product-service latest 119a3f98ad0c 9 seconds ago 490MB
$
```

```

$ docker run --rm -p8080:8080 -e "SPRING_PROFILES_ACTIVE=docker" product-service

:: Spring Boot ::                (v2.1.0.RELEASE)

2019-08-30 09:04:58.489 INFO 1 --- [main] s.m.m.c.p.ProductServiceApplication : Starting ProductServiceApplication on 9dc086e4a88b
with PID 1 (/app.jar started by root in /)
2019-08-30 09:04:58.493 DEBUG 1 --- [main] s.m.m.c.p.ProductServiceApplication : Running with Spring Boot v2.1.0.RELEASE, Spring v5.1.2.RELEASE
2019-08-30 09:04:58.493 INFO 1 --- [main] s.m.m.c.p.ProductServiceApplication : The following profiles are active: docker
2019-08-30 09:04:59.620 WARN 1 --- [main] reactor.netty.tcp.TcpResources : [http] resources will use the default LoopResources
: DefaultLoopResources {prefix=reactor-http, daemon=true, selectCount=12, workerCount=12}
2019-08-30 09:04:59.620 WARN 1 --- [main] reactor.netty.tcp.TcpResources : [https] resources will use the default ConnectionProvider
vider: PooledConnectionProvider {name=http, poolFactory=reactor.netty.resources.ConnectionProvider$$Lambda$269/0x000000008013edc4@04c2bb6e0}
2019-08-30 09:05:00.277 INFO 1 --- [main] o.s.b.a.e.web.EndpointLinksResolver : Exposing 2 endpoint(s) beneath base path '/actuator'
2019-08-30 09:05:00.816 INFO 1 --- [main] o.s.b.web.embedded.netty.NettyWebServer : Netty started on port(s): 8080
2019-08-30 09:05:00.824 INFO 1 --- [main] s.m.m.c.p.ProductServiceApplication : Started ProductServiceApplication in 2.824 seconds
(JVM running for 3.361)
```

```
6. @b394afed9384:/ (bash)
$ curl localhost:8080/product/3
{"productId":3,"name":"name-3","weight":123,"serviceAddress":"9dc086e4a88b/172.17.0.2:8080"}
$
```



```
6. @b394afed9384:/ (bash)
$ docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
9dc086e4a88b      product-service    "java -jar /app.jar" 3 minutes ago       Up 3 minutes       0.0.0.0:8080->8080/tcp eloquent_jones
```

```
6. @b394afed9384:/ (bash)
$ docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
f4c8645902c6      product-service    "java -jar /app.jar" 13 seconds ago      Up 11 seconds       0.0.0.0:8080->8080/tcp my-prd-srv
```

```
6. @b394afed9384:/ (bash)
$ docker images | grep chapter04
chapter04_product-composite latest a04b5b1cfd4a 19 seconds ago 490MB
chapter04_review          latest 72ca17df2799 21 seconds ago 490MB
chapter04_recommendation latest c44e8f50dc51 22 seconds ago 490MB
chapter04_product         latest a0f9f70b6ed8 24 seconds ago 490MB
$
```

```
6. @b394afed9384:/ (bash)
$ docker-compose logs -f
...
review_1 | 2018-11-04 09:22:03.618 INFO 1 --- [ main] s.m.m.c.review.ReviewServiceApplication
: Started ReviewServiceApplication in 6.051 seconds (JVM running for 6.952)
...
product-composite_1 | 2018-11-04 09:22:03.151 INFO 1 --- [ main] m.c.p.ProductCompositeServiceApplication : Started ProductCompositeServiceApplication in 6.414 seconds (JVM running for 6.936)
...
recommendation_1 | 2018-11-04 09:22:03.542 INFO 1 --- [ main] m.m.c.r.RecommendationServiceApplication : Started RecommendationServiceApplication in 6.199 seconds (JVM running for 7.131)
...
product_1 | 2018-11-04 09:22:04.250 INFO 1 --- [ main] s.m.m.c.p.ProductServiceApplication : Started ProductServiceApplication in 6.212 seconds (JVM running for 7.614)
```

```
6. @b394afed9384:/ (bash)
$ curl localhost:8080/product-composite/123 -s | jq .
{
  "productId": 123,
  ...
  "recommendations": [ ... ],
  "reviews": [ ... ],
  "serviceAddresses": { ... }
}
$
```

```
6. @b394afed9384:/ (bash)
"serviceAddresses": {
  "cmp": "98059be902bf/172.21.0.2:8080",
  "pro": "99774d9be7b8/172.21.0.4:8080",
  "rev": "a89da16763d9/172.21.0.5:8080",
  "rec": "2a846794a1d0/172.21.0.3:8080"
}
```

```
6. @b394afed9384:/ (bash)
$ ./test-em-all.bash start stop
Start: Sun Nov 4 13:17:45 CET 2018
HOST=localhost
PORT=8080
Restarting the test environment...
$ docker-compose down
Removing network chapter04_default
WARNING: Network chapter04_default not found.
$ docker-compose up -d
Creating network "chapter04_default" with the default driver
Creating chapter04_product_1 ... done
Creating chapter04_review_1 ... done
Creating chapter04_product-composite_1 ... done
Creating chapter04_recommendation_1 ... done
Wait for: http://localhost:8080/product-composite/1... not yet, retry #1 not yet, retry #2 0k
...Tests OK...
We are done, stopping the test environment...
$ docker-compose down
Stopping chapter04_recommendation_1 ... done
Stopping chapter04_review_1 ... done
Stopping chapter04_product_1 ... done
Stopping chapter04_product-composite_1 ... done
Removing chapter04_recommendation_1 ... done
Removing chapter04_review_1 ... done
Removing chapter04_product_1 ... done
Removing chapter04_product-composite_1 ... done
Removing network chapter04_default
End: Sun Nov 4 13:18:03 CET 2018
$
```

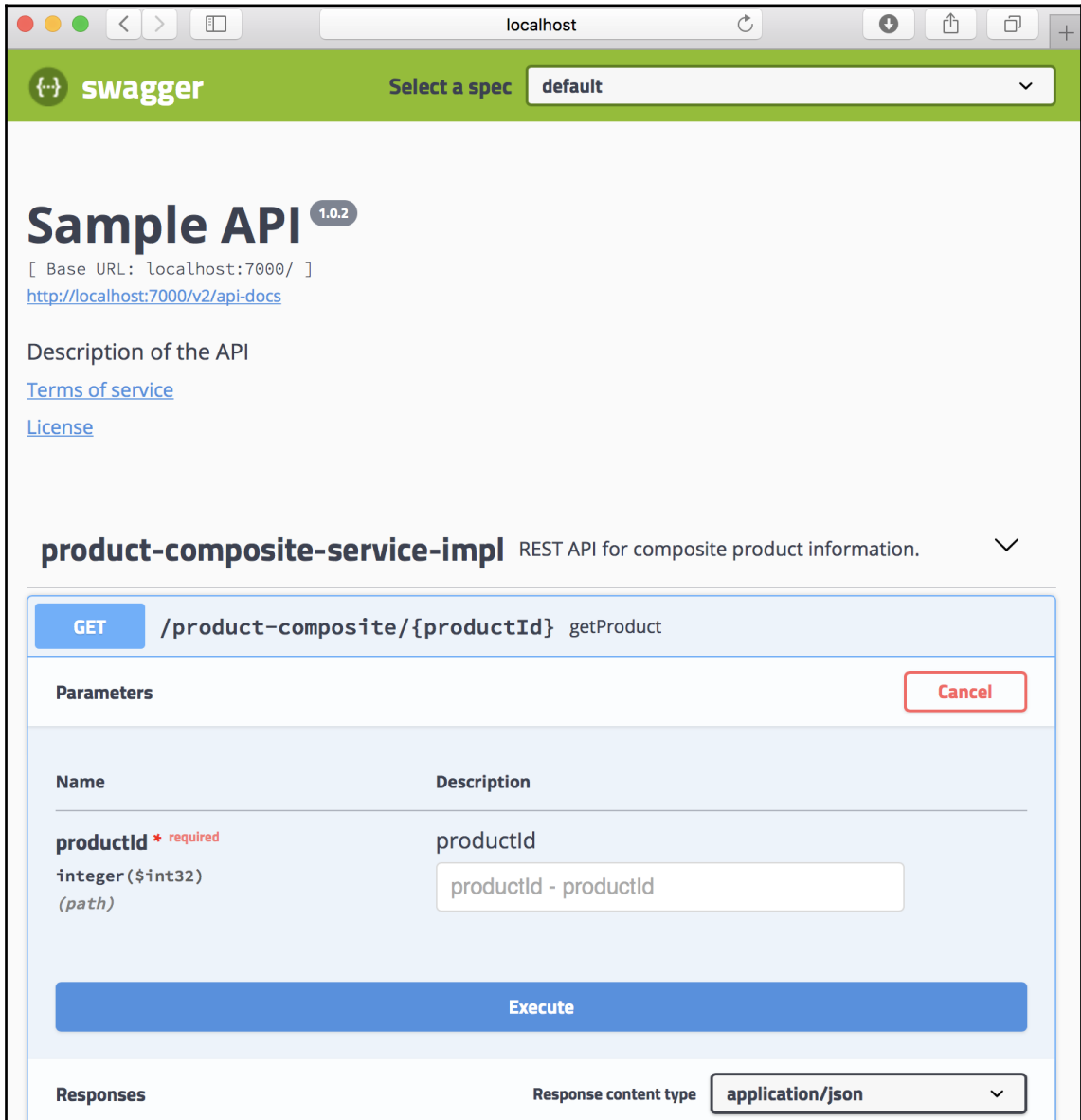
```
2. Chapter04 (bash)
Chapter04 $ docker-compose ps

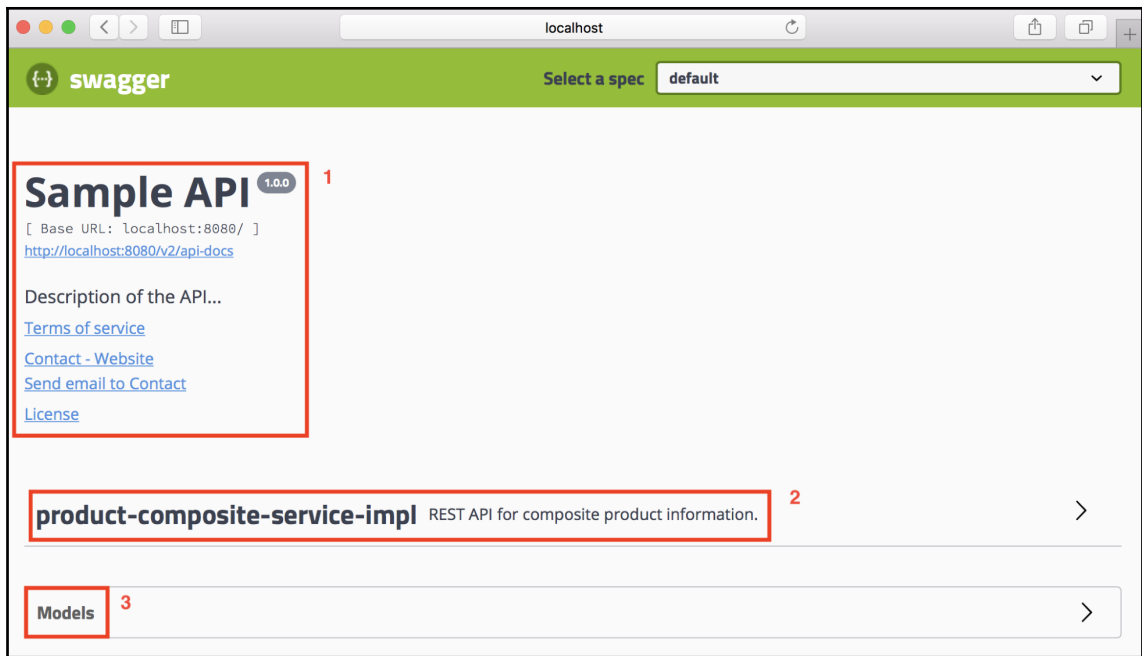
```

Name	Command	State	Ports
chapter04_product-composite_1	java -jar /app.jar	Up	0.0.0.0:8080->8080/tcp
chapter04_product_1	java -jar /app.jar	Up	8080/tcp
chapter04_recommendation_1	java -jar /app.jar	Up	8080/tcp
chapter04_review_1	java -jar /app.jar	Up	8080/tcp

```
Chapter04 $
```

Chapter 5: Adding an API Description Using OpenAPI/Swagger





localhost

product-composite-service-impl REST API for composite product information.

GET

/product-composite/{productId}

Returns a composite view of the specified product id

1

2

Normal response

If the requested product id is found the method will return information regarding:

1. Base product information
2. Reviews
3. Recommendations
4. Service Addresses\n(technical information regarding the addresses of the microservices that created the response)

Expected partial and error responses

In the following cases, only a partial response be created (used to simplify testing of error conditions)

Product id 113

200 - Ok, but no recommendations will be returned

Product id 213

200 - Ok, but no reviews will be returned

Non numerical product id

400 - A **Bad Request** error will be returned

Product id 13

404 - A **Not Found** error will be returned

Negative product ids

422 - An **Unprocessable Entity** error will be returned

Parameters

Try it out

Name	Description
productId * required	productId
integer(\$int32)	
(path)	

localhost

Responses

Response content typeapplication/json

Code	Description
200	OK Example Value Model <pre>{ "name": "string", "productId": 0, "recommendations": [{ "author": "string", "rate": 0, "recommendationId": 0 }], "reviews": [{ "author": "string", "reviewId": 0, "subject": "string" }], "serviceAddresses": { "cmp": "string", "pro": "string", "rec": "string", "rev": "string" }, "weight": 0 }</pre>
400	Bad Request, invalid format of the request. See response message for more information.
404	Not found, the specified id does not exist.
422	Unprocessable entity, input parameters caused the processing to fails. See response message for more information.

localhost

Parameters

Cancel

Name	Description
productId * required integer(\$int32) (path)	productId 123

Execute

Clear

Responses

Response content type application/json

Curl

```
curl -X GET "http://localhost:8080/product-composite/123" -H "accept: application/json"
```

Request URL

```
http://localhost:8080/product-composite/123
```

Server response

Code	Details
200	Response body<pre>{ "productId": 123, "name": "name-123", "weight": 123, "recommendations": [{ "recommendationId": 1, "author": "Author 1", "rate": 1 }, { "recommendationId": 2, "author": "Author 2", "rate": 2 }] }</pre>

localhost

Name

Description

productId * required

productId

integer(\$int32)

-1

(path)

Execute

Clear

Responses

Response content type application/json

Curl

curl -X GET "http://localhost:8080/product-composite/-1" -H "accept: application/json"

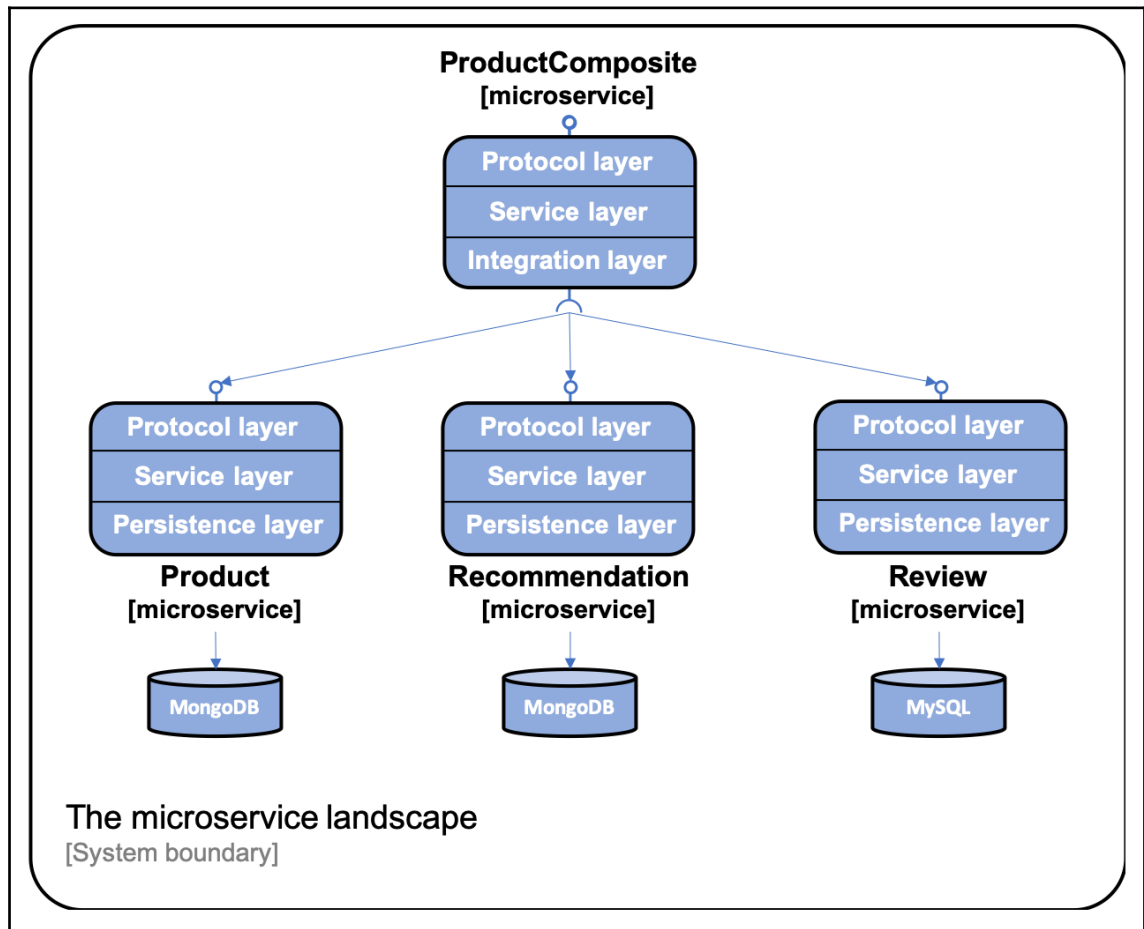
Request URL

http://localhost:8080/product-composite/-1

Server response

Code	Details
422	Error: Unprocessable Entity Response body <pre>{ "timestamp": "2018-11-13T04:57:14.516925Z", "path": "/product-composite/-1", "message": "Invalid productId: -1", "status": 422, "error": "Unprocessable Entity" }</pre> Download Response headers <pre>content-length: 152 content-type: application/json;charset=UTF-8</pre>

Chapter 6: Adding Persistence



```
2. bash
{ "_id" : ..., "productId" : 1, "name" : "product 1", "weight" : 1 }
{ "_id" : ..., "productId" : 113, "name" : "product 113", "weight" : 113 }
{ "_id" : ..., "productId" : 213, "name" : "product 213", "weight" : 213 }
$
```

```
2. bash
+-----+-----+-----+-----+-----+
| id | author | content | product_id | review_id |
+-----+-----+-----+-----+-----+
| 1 | author 1 | content 1 | 1 | 1 |
| 2 | author 2 | content 2 | 1 | 2 |
+-----+-----+-----+-----+-----+
$ █
```

```
2. bash
BUILD SUCCESSFUL
$ █
```

```
2. bash
Connected to MongoDB: localhost:27017
```

localhost

product-composite-service-impl REST API for composite product information. ✓

POST

/product-composite

Creates a composite product

GET

/product-composite/{productId}

Returns a composite view of the specified product id

DELETE

/product-composite/{productId}

Deletes a product composite

Normal response

Entities for product information, recommendations and reviews related to the specified productId will be deleted. The implementation of the delete method is idempotent, i.e. it can be called several times with the same response. This means that a delete request of a non existing product will return **200 Ok**.

Parameters

Try it out

localhost

1 product-composite-service-impl REST API for composite product information. ✓

POST /product-composite Creates a composite product

body * required (body)

body

Edit Value | Model

```
{
  "name": "string",
  "productId": 123456,
  "recommendations": [
    {
      "author": "string",
      "content": "string",
      ...
    }
  ]
}
```

Execute

Server response

Code 200

Details

Response headers

content-length: 0

```
2. bash
product-composite_1 | ... createCompositeProduct: creates a new composite entity for productId: 123456
product_1 | ... createProduct: entity created for productId: 123456
recommendation_1 | ... createRecommendation: created a recommendation entity: 123456/0
review_1 | ... createReview: created a review entity: 123456/0
```

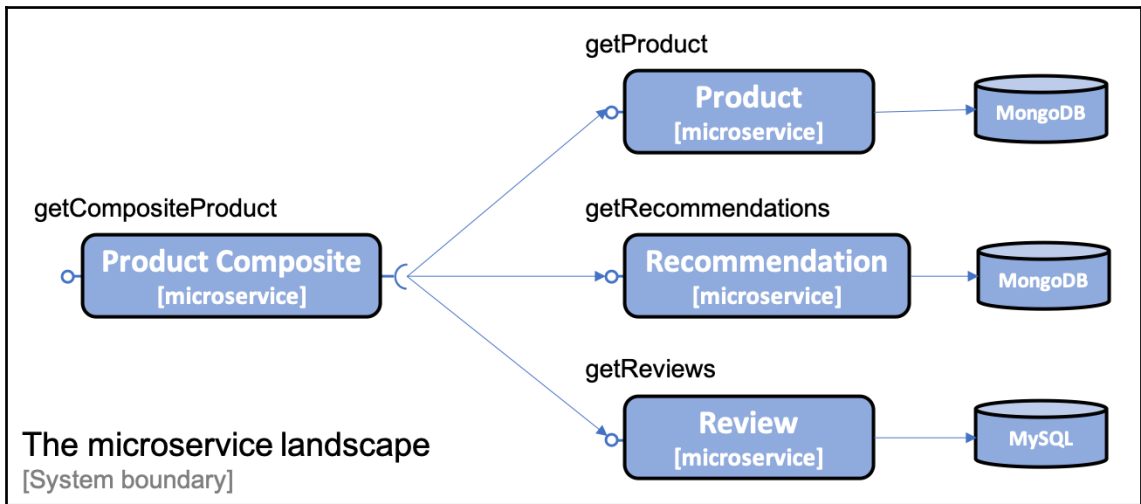
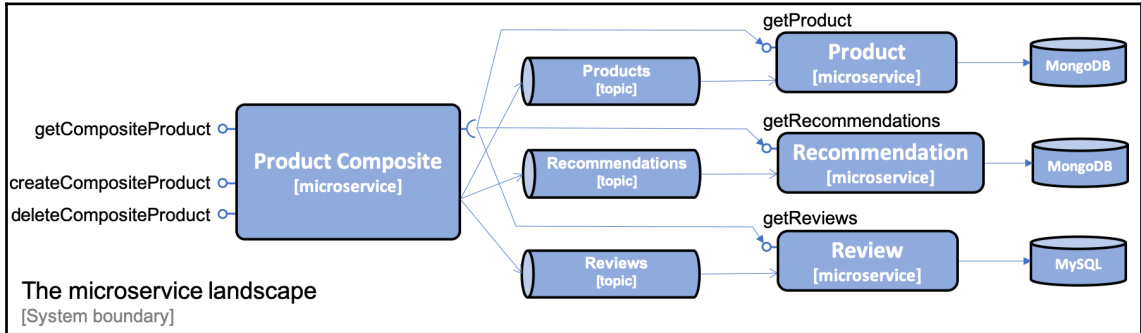
```
2. bash
{ "_id" : ObjectId("5c04ed370e8e3d000102ef94"), "version" : 0, "productId" : 123456, "name" : "string",
  "weight" : 0, "_class" : "se.magnus.microservices.core.product.persistence.ProductEntity" }
$
```

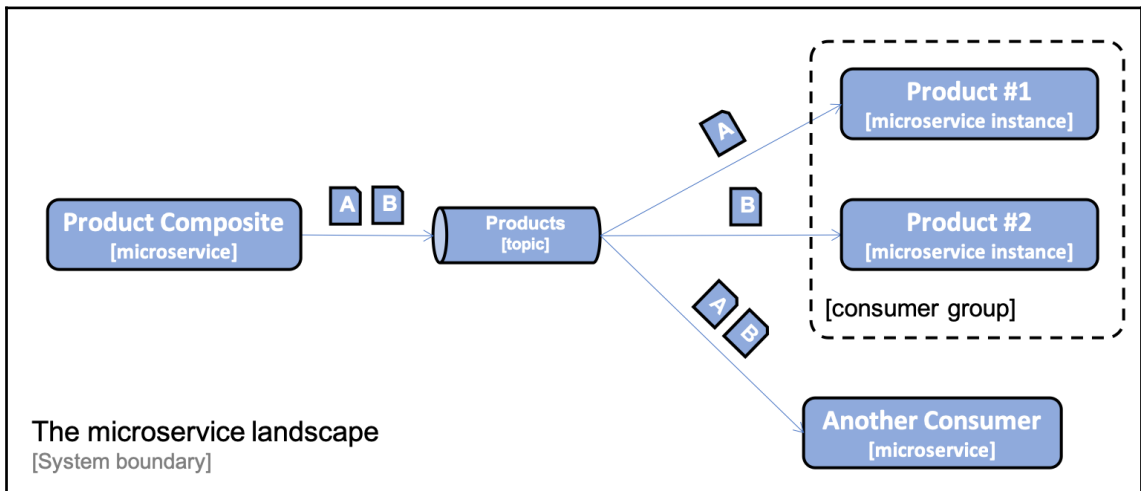
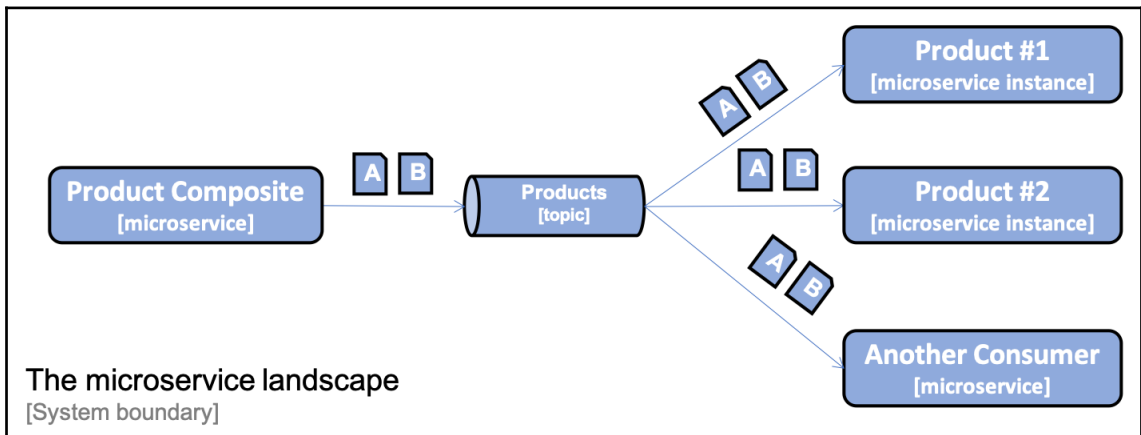
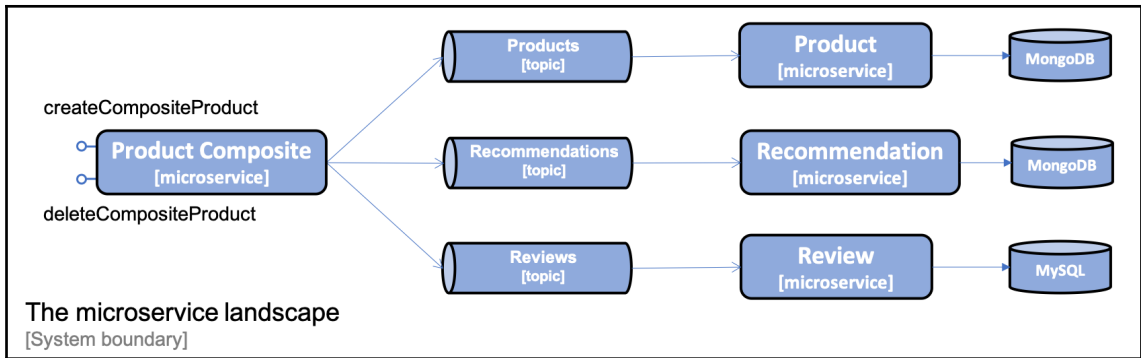
```
2. bash
{ "_id" : ObjectId("5c04ed378b87bc000133c349"), "version" : 0, "productId" : 123456,
  "recommendationId" : 0, "author" : "string", "rating" : 0, "content" : "string",
  "_class" : "se.magnus.microservices.core.recommendation.persistence.RecommendationEntity" }
$
```

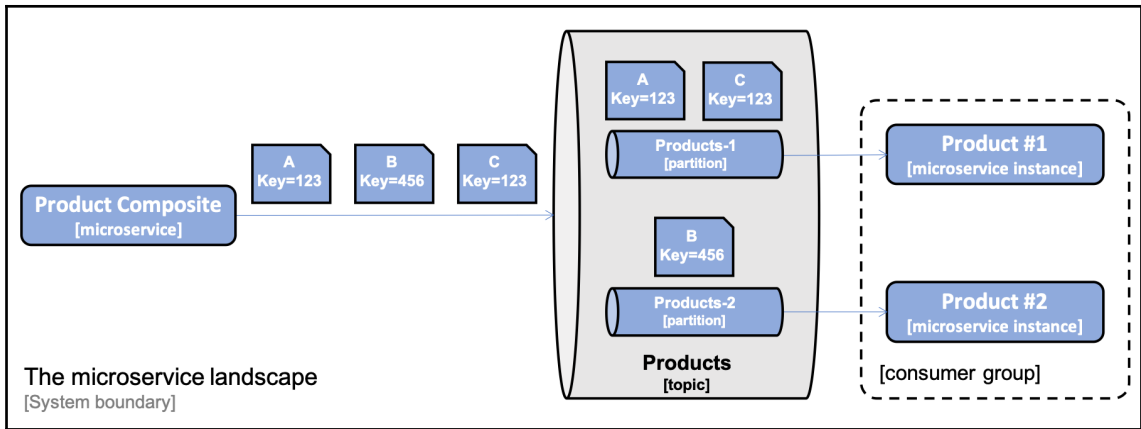
```
2. bash
+-----+-----+-----+-----+-----+-----+
| id | author | content | product_id | review_id | subject | version |
+-----+-----+-----+-----+-----+-----+
| 1 | string | string | 123456 | 0 | string | 0 |
+-----+-----+-----+-----+-----+-----+
$
```

```
2. bash
End: Wed Dec 5 06:48:20 CET 2018
$
```

Chapter 7: Developing Reactive Microservices







```
2. @700dd0df9ffe:/ (bash)
{
  "status": "UP",
  ...
  "coreServices": {
    "status": "UP",
    "details": {
      "product": {
        "status": "UP"
      },
      "review": {
        "status": "UP"
      },
      "recommendation": {
        "status": "UP"
      }
    }
  }
  ...
}
$ █
```

RabbitMQ Management

x

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↺

localhost:15672/#/queues

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⋮

RabbitMQ

3.7.8 Erlang 20.3.8.5

Refreshed 2019-02-08 18:28:33

Refresh every 5 seconds

Virtual host

All

Cluster

rabbit@822c9e3ebc02

User

guest

Log out

Overview

Connections

Channels

Exchanges

Queues

Admin

Queues

▼ All queues (9)

Page

1

of 1

- Filter:

☐ Regex ?

Displaying 9 items , page size up to:

100

Overview			Messages			Message rates			+/-
Name	Features	State	Ready	Unacked	Total	incoming	deliver / get	ack	
products.auditGroup	D	idle	1	0	1	0.00/s	0.00/s	0.00/s	
products.productsGroup	D DLX DLK	idle	0	0	0	0.00/s	0.00/s	0.00/s	
products.productsGroup.dlq	D	idle	0	0	0				
recommendations.auditGroup	D	idle	3	0	3	0.00/s			
recommendations.recommendationsGroup	D DLX DLK	idle	0	0	0	0.00/s	0.00/s	0.00/s	
recommendations.recommendationsGroup.dlq	D	idle	0	0	0				
reviews.auditGroup	D	idle	3	0	3	0.00/s			
reviews.reviewsGroup	D DLX DLK	idle	0	0	0	0.00/s	0.00/s	0.00/s	
reviews.reviewsGroup.dlq	D	idle	0	0	0				

► Add a new queue

HTTP API

Server Docs

Tutorials

Community Support

Community Slack

Commercial Support

Plugins

GitHub

Changelog

[39]

RabbitMQ Management

localhost:15672/#/queues/%2F/products.auditGroup

Refreshed 2019-02-08 18:29:04 Refresh every 5 seconds

RabbitMQ

3.7.8 Erlang 20.3.8.5

Virtual host All

Cluster rabbit@822c9e3ebc02

User guest Log out

Overview

Connections

Channels

Exchanges

Queues

Admin

Get messages

Warning: getting messages from a queue is a destructive action. ?

Ack Mode: Nack message requeue true

Encoding: Auto string / base64 ?

Messages: 1

Get Message(s)

Message 1

The server reported 0 messages remaining.

Exchange	products
Routing Key	products
Redelivered	
Properties	timestamp: 1549645123 message_id: 0ada8221-6a2d-fa8d-9b8c-640879dcd6 priority: 0 delivery_mode: 2 headers: content_type: application/json
Payload	158 bytes Encoding: string {"eventType": "CREATE", "key": 1, "data": {"productId": 1, "name": "product name C", "weight": 300, "serviceAddress": null}, "eventCreat

RabbitMQ Management

localhost:15672/#/queues

Refreshed 2019-02-08 18:53:19

Refresh every 5 seconds

Virtual host: All

Cluster: rabbit@0d45af3c3f78

User: guest [Log out](#)

Overview

Connections

Channels

Exchanges

Queues

Admin

Queues

▼ All queues (15)

Pagination

Page 1 of 1 - Filter:

☐ Regex ?

Displaying 15 items , page size up to: 100

Overview			Messages			Message rates			+/-
Name	Features	State	Ready	Unacked	Total	incoming	deliver / get	ack	
products.auditGroup-0	D	idle	1	0	1	0.00/s	0.00/s	0.00/s	
products.auditGroup-1	D	idle	1	0	1	0.00/s			
products.productsGroup-0	D DLX DLK	idle	0	0	0	0.00/s	0.00/s	0.00/s	
products.productsGroup-1	D DLX DLK	idle	0	0	0	0.00/s	0.00/s	0.00/s	
products.productsGroup.dlq	D	idle	0	0	0				
recommendations.auditGroup-0	D	idle	3	0	3	0.00/s			
recommendations.auditGroup-1	D	idle	3	0	3	0.00/s			
recommendations.recommendationsGroup-0	D DLX DLK	idle	0	0	0	0.00/s	0.00/s	0.00/s	
recommendations.recommendationsGroup-1	D DLX DLK	idle	0	0	0	0.00/s	0.00/s	0.00/s	
recommendations.recommendationsGroup.dlq	D	idle	0	0	0				
reviews.auditGroup-0	D	idle	3	0	3	0.00/s			
reviews.auditGroup-1	D	idle	3	0	3	0.00/s			
reviews.reviewsGroup-0	D DLX DLK	idle	0	0	0	0.00/s	0.00/s	0.00/s	
reviews.reviewsGroup-1	D DLX DLK	idle	0	0	0	0.00/s	0.00/s	0.00/s	
reviews.reviewsGroup.dlq	D	idle	0	0	0				

```
2. @700dd0df9ffe:/ (bash)
error.products.productsGroup
error.recommendations.recommendationsGroup
error.reviews.reviewsGroup
products
recommendations
reviews
$ █
```

```
2. @700dd0df9ffe:/ (bash)
Topic:products PartitionCount:2 ReplicationFactor:1 Configs:
  Topic: products Partition: 0 Leader: 1001 Replicas: 1001 Isr: 1001
  Topic: products Partition: 1 Leader: 1001 Replicas: 1001 Isr: 1001
$ █
```

```
2. @700dd0df9ffe:/ (bash)
{"eventType":"CREATE","key":2,"data":{"productId":2,"name":"product name C","weight":300,
"serviceAddress":null},"eventCreatedAt":"2019-02-09T07:21:09.014259"}
{"eventType":"DELETE","key":2,"data":null,"eventCreatedAt":"2019-02-09T07:23:04.017709"}
{"eventType":"CREATE","key":1,"data":{"productId":1,"name":"product name C","weight":300,
"serviceAddress":null},"eventCreatedAt":"2019-02-09T07:18:11.600382"}
{"eventType":"DELETE","key":1,"data":null,"eventCreatedAt":"2019-02-09T07:23:02.359117"}
$ █
```

```
2. @700dd0df9ffe:/ (bash)
{"eventType":"CREATE","key":1,"data":{"productId":1,"name":"product name C","weight":300,
"serviceAddress":null},"eventCreatedAt":"2019-02-09T07:18:11.600382"}
{"eventType":"DELETE","key":1,"data":null,"eventCreatedAt":"2019-02-09T07:23:02.359117"}
$ █
```

Chapter 8: Introduction to Spring Cloud

Eureka

localhost:8761

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HOMELAST 1000 SINCE STARTUP

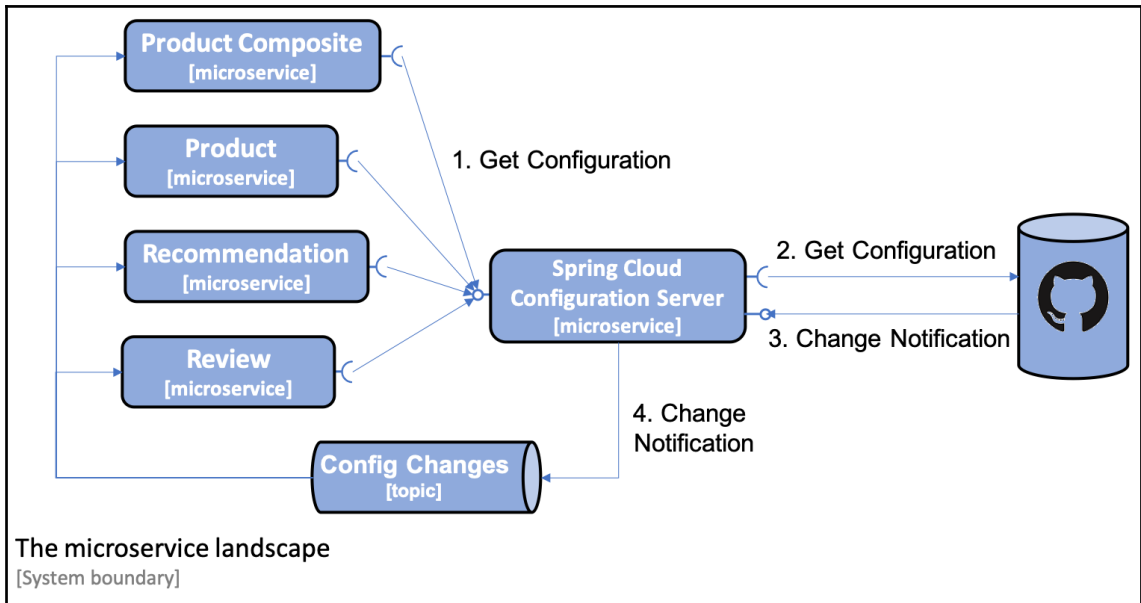
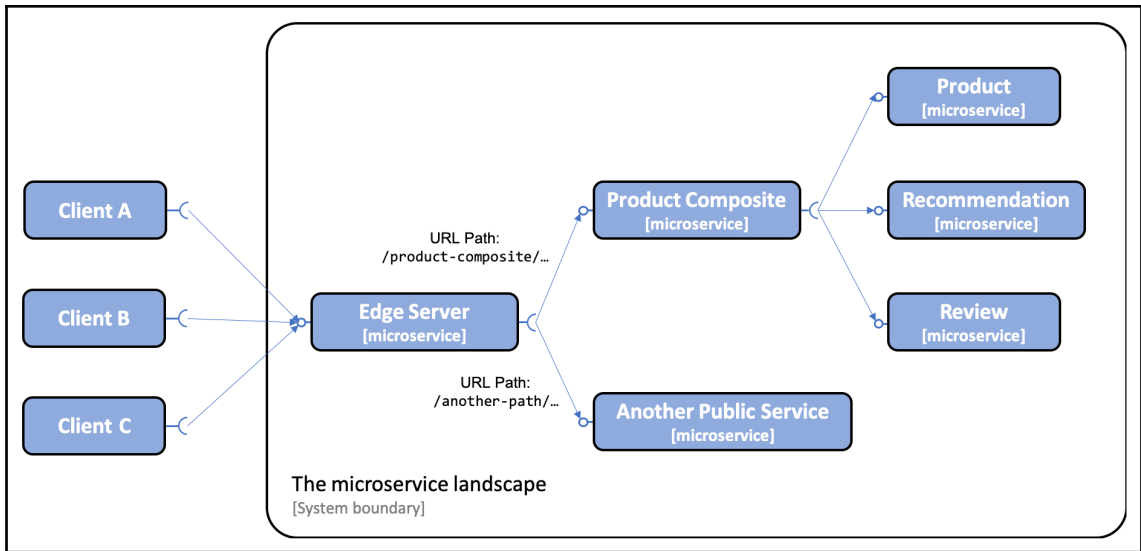
System Status

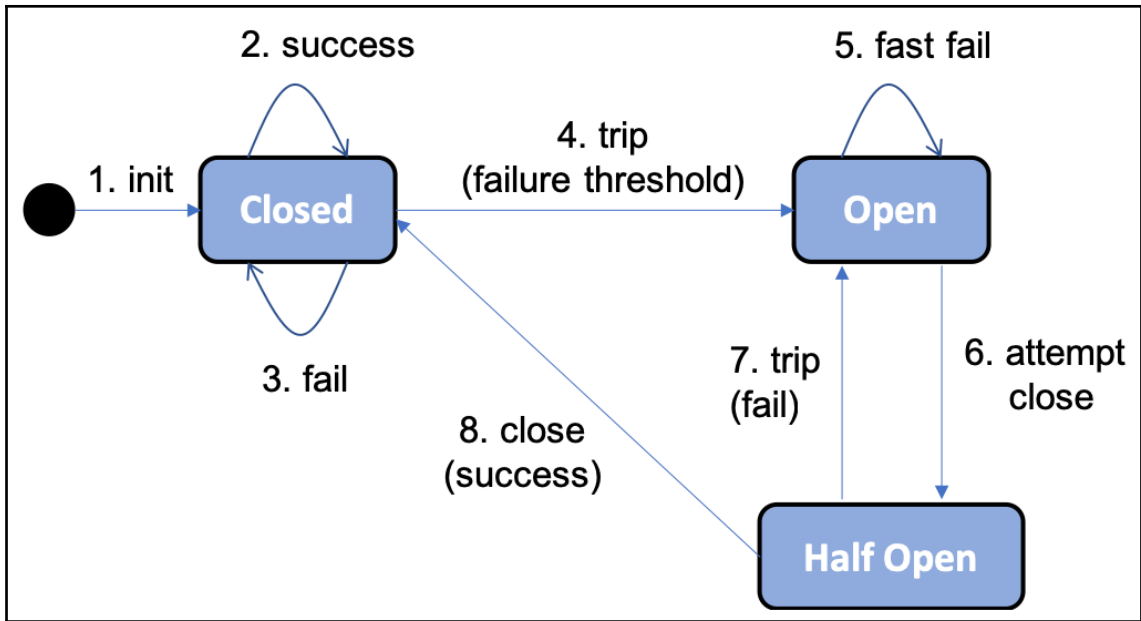
Environment	test	Current time	2019-02-18T08:47:32 +0000
Data center	default	Uptime	00:03
		Lease expiration enabled	true
		Renews threshold	11
		Renews (last min)	238

DS Replicas

Instances currently registered with Eureka

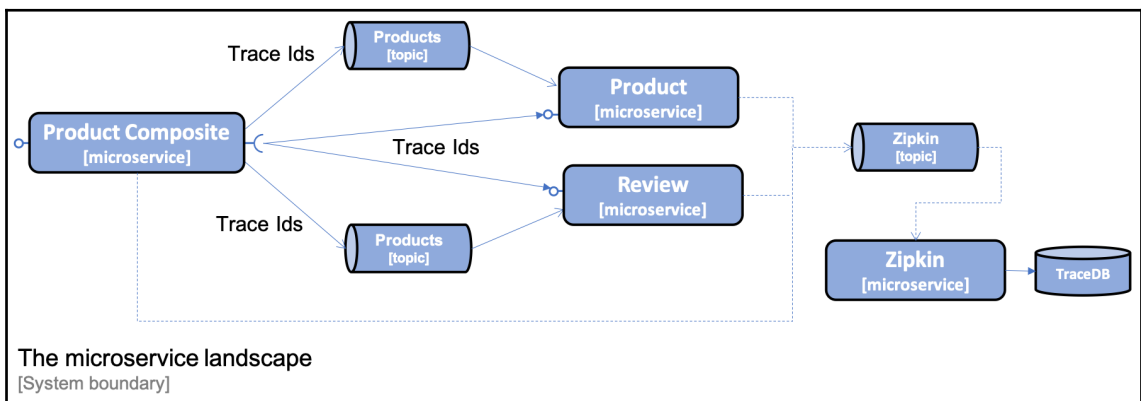
Application	AMIs	Availability Zones	Status
PRODUCT	n/a (1)	(1)	UP (1) - fa1fc9bf436f:product:8080
PRODUCT-COMPOSITE	n/a (1)	(1)	UP (1) - 94d4177d3640:product-composite:8080
RECOMMENDATION	n/a (1)	(1)	UP (1) - c6e43eb833e9:recommendation:8080
REVIEW	n/a (3)	(3)	UP (3) - ab40a2d0737a:review:8080 , 7f27b4e75d9d:review:8080 , 61a078ca25c9:review:8080

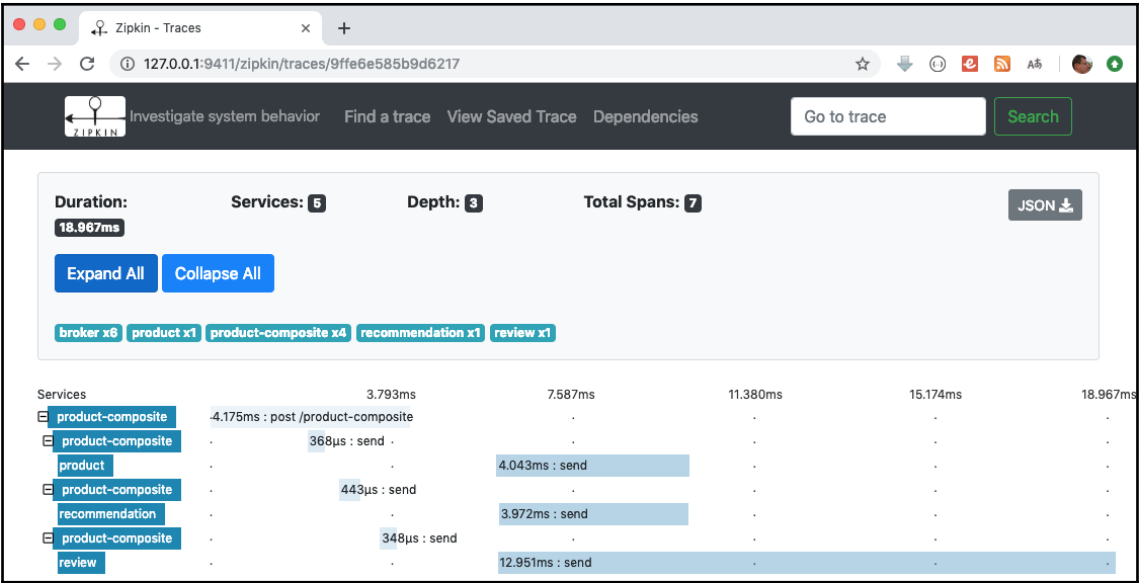




```
2. @700dd0df9ffe:/ (bash)
{
  "status": "UP",
  "details": {
    "failureRate": "-1.0%",
    "failureRateThreshold": "50.0%",
    "maxBufferedCalls": 5,
    "bufferedCalls": 3,
    "failedCalls": 0,
    "notPermittedCalls": 0
  }
}
$
```

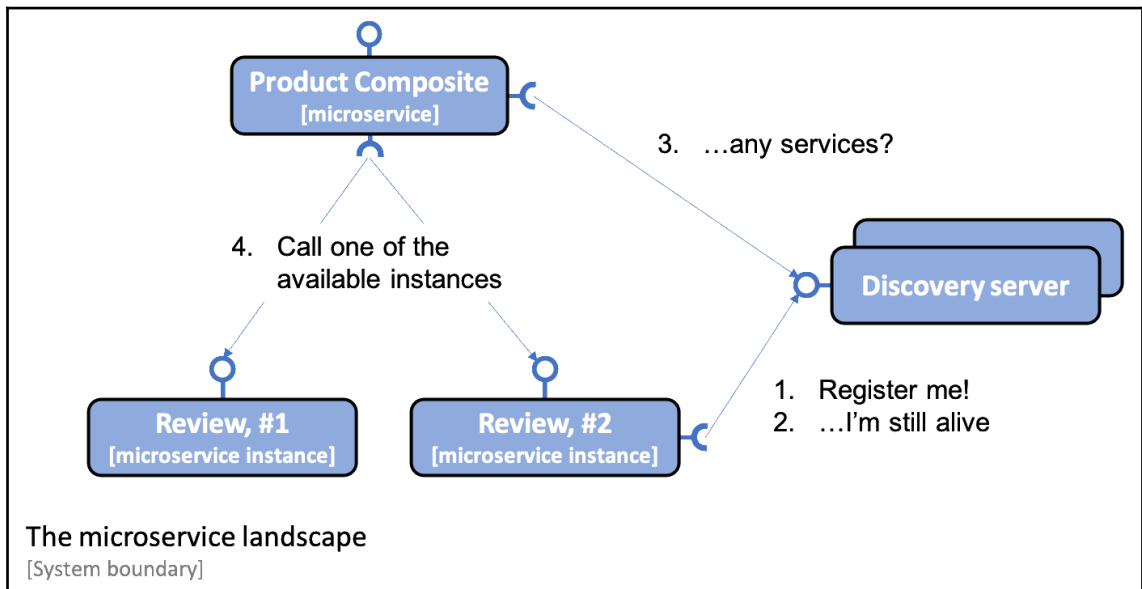
```
2. @700dd0df9ffe:/ (bash)
{
  "status" : "DOWN",
  "details" : {
    "failureRate" : "100.0%",
    "failureRateThreshold" : "50.0%",
    "maxBufferedCalls" : 3,
    "bufferedCalls" : 3,
    "failedCalls" : 3,
    "notPermittedCalls" : 1
  }
}
$
```





Chapter 9: Adding Service Discovery Using Netflix Eureka and Ribbon

```
2. @700dd0df9ffe:/ (bash)
2a9c84113fc5/172.20.0.8:8080
$
```



```
2. @700dd0df9ffe:/ (bash)
$ ./test-em-all.bash start
Start Tests: Fri Sep 6 19:46:54 CEST 2019
...
Creating chapter09_rabbitmq_1 ... done
...
Wait for: curl http://localhost:8080/actuator/health... , retry #1 ... Test OK (HTTP Code: 200)
Test OK ...
End, all tests OK: Fri Sep 6 19:47:54 CEST 2019
$
```

Eureka

localhost:8761

spring Eureka

HOME LAST 1000 SINCE STARTUP

System Status

Environment	test	Current time	2019-02-18T08:47:32 +0000
Data center	default	Uptime	00:03
		Lease expiration enabled	true
		Renews threshold	11
		Renews (last min)	238

DS Replicas

Instances currently registered with Eureka

Application	AMIs	Availability Zones	Status
PRODUCT	n/a (1)	(1)	UP (1) - fa1fc9bf436f:product:8080
PRODUCT-COMPOSITE	n/a (1)	(1)	UP (1) - 94d4177d3640:product-composite:8080
RECOMMENDATION	n/a (1)	(1)	UP (1) - c6e43eb833e9:recommendation:8080
REVIEW	n/a (3)	(3)	UP (3) - ab40a2d0737a:review:8080 , 7f27b4e75d9d:review:8080 , 61a078ca25c9:review:8080

2. @700dd0df9ffe:/ (bash)

review_2 | ... Started ReviewServiceApplication in 21.812 seconds (JVM running for 23.086)

review_3 | ... Started ReviewServiceApplication in 22.018 seconds (JVM running for 23.134)

```
2. @700dd0df9ffe:/ (bash)
3c7a676d8a5c:product-composite:8080
ac0a272e4488:product:8080
4034b100443e:review:8080
9599fead507d:review:8080
43d3788ce4e1:review:8080
f50156c9882a:recommendation:8080
$
```

```
2. @700dd0df9ffe:/ (bash)
4034b100443e/192.168.96.9:8080
43d3788ce4e1/192.168.96.10:8080
9599fead507d/192.168.96.11:8080
$
```

```
2. @700dd0df9ffe:/ (bash)
review_1 | 2019-03-02 12:20:45.420 DEBUG ... : getReviews: response size: 3
review_2 | 2019-03-02 12:20:46.059 DEBUG ... : getReviews: response size: 3
review_3 | 2019-03-02 12:21:12.500 DEBUG ... : getReviews: response size: 3
```

```
2. @700dd0df9ffe:/ (bash)
"rev": "4034b100443e/192.168.96.9:8080"
"rev": "9599fead507d/192.168.96.11:8080"
```

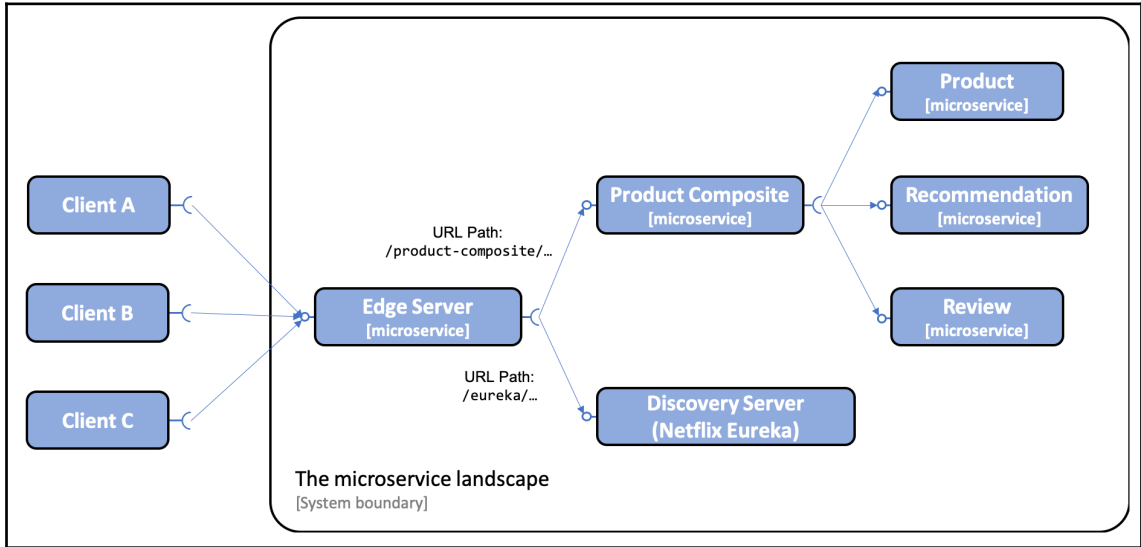
```
2. @700dd0df9ffe:/ (bash)
4034b100443e/192.168.96.9:8080
9599fead507d/192.168.96.11:8080
```

```
2. @700dd0df9ffe:/ (bash)
"pro": "0a20cc1efaae/172.18.0.9:8080"
```

```
2. @700dd0df9ffe:/ (bash)
"pro": "cbfd07416ddc/192.168.128.3:8080",
"rev": "c5cc1f087afe/192.168.128.9:8080",
```

```
2. @700dd0df9ffe:/ (bash)
"pro": "18d6e52267c2/192.168.128.7:8080",
"rev": "c5cc1f087afe/192.168.128.9:8080",
```


Chapter 10: Using Spring Cloud Gateway to Hide Microservices Behind an Edge Server



```
2. @700dd0df9ffe:/ (bash)
$ ./test-em-all.bash start
Start Tests: Fri Sep 6 19:46:54 CEST 2019
...
Creating chapter09_rabbitmq_1 ... done
...
Wait for: curl http://localhost:8080/actuator/health... , retry #1 ... Test OK (HTTP Code: 200)
Test OK ...
End, all tests OK: Fri Sep 6 19:47:54 CEST 2019
$
```

```
2. @700dd0df9ffe:/ (bash)
book-source-code_gateway_1      0.0.0.0:8080->8080/tcp
book-source-code_eureka_1       8761/tcp
book-source-code_product-composite_1 8080/tcp
book-source-code_product_1       8080/tcp
book-source-code_recommendation_1 8080/tcp
book-source-code_review_1        8080/tcp
$
```

```
2. @700dd0df9ffe:/ (bash)
{
  "eureka-api": "/eureka/api/{segment}"
}
{
  "eureka-web-start": "/eureka/web"
}
{
  "eureka-web-other": "/eureka/**"
}
{
  "product-composite": "/product-composite/**"
}
{
  "host_route_200": "i.feel.lucky:8080"
}
{
  "host_route_418": "im.a.teapot:8080"
}
{
  "host_route_501": "/headerrouting/**"
}
$
```

```
2. @700dd0df9ffe:/ (bash)
{"productId":2, ... "recommendations":[...],"reviews":[...],"serviceAddresses":{"...}}
$
```

```
2. @700dd0df9ffe:/ (bash)
b91cde7148d9:gateway:8080
b8013440aea0:product-composite:8080
7c9a92146991:product:8080
21668e72a668:review:8080
ffcbdb9f32a4:recommendation:8080
$
```

Eureka

localhost:8080/eureka/web

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HOMELAST 1000 SINCE STARTUP

System Status

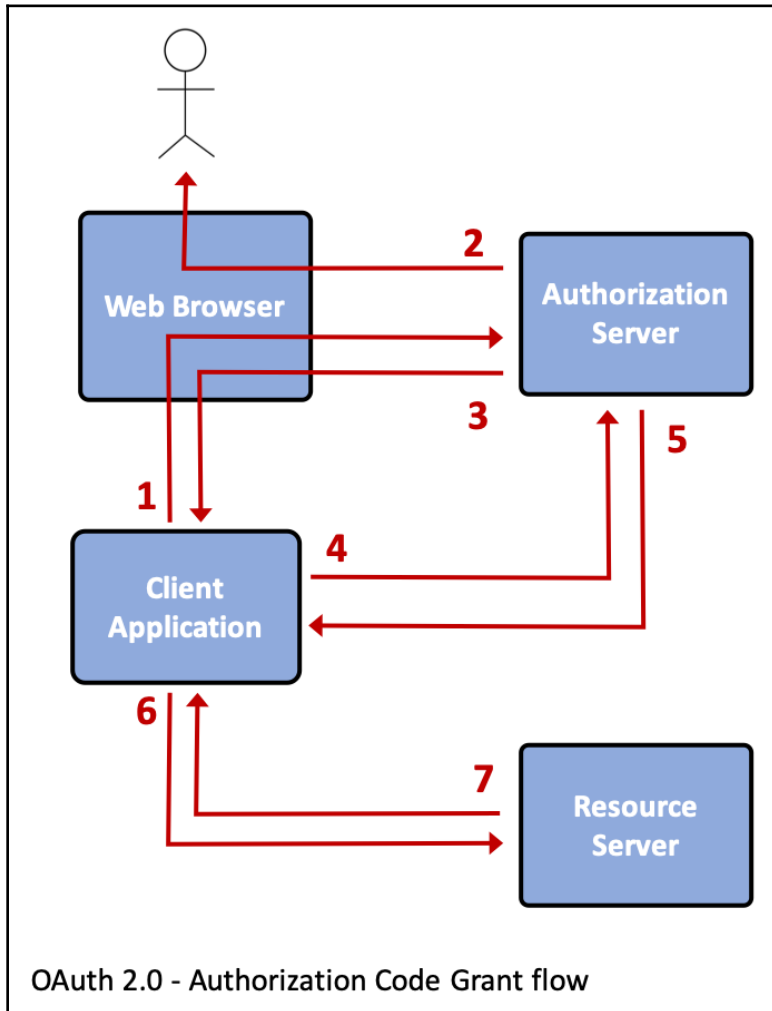
Environment	test	Current time	2019-03-28T19:43:51 +0000
Data center	default	Uptime	10:10
		Lease expiration enabled	true
		Renews threshold	17
		Renews (last min)	60

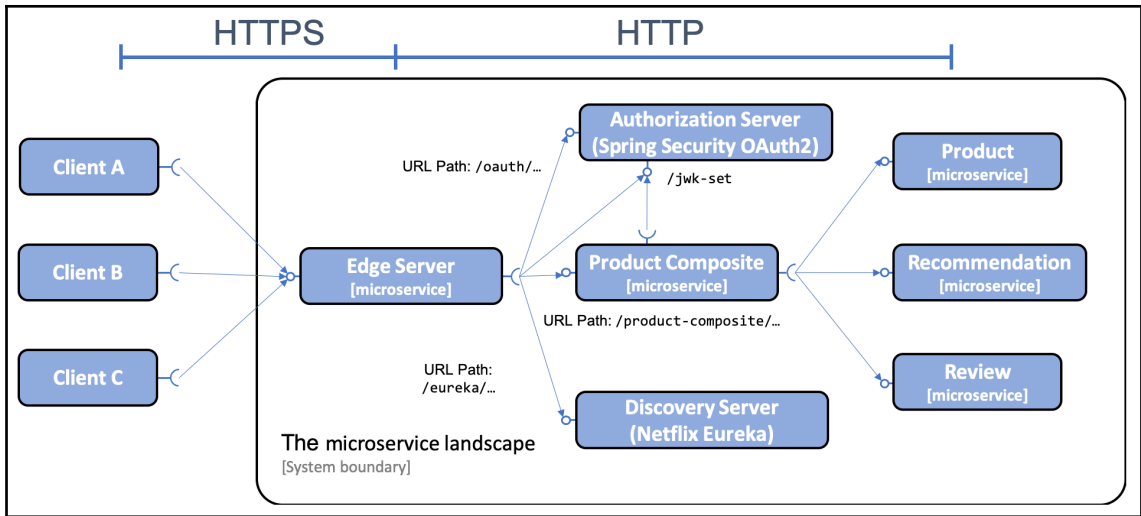
DS Replicas

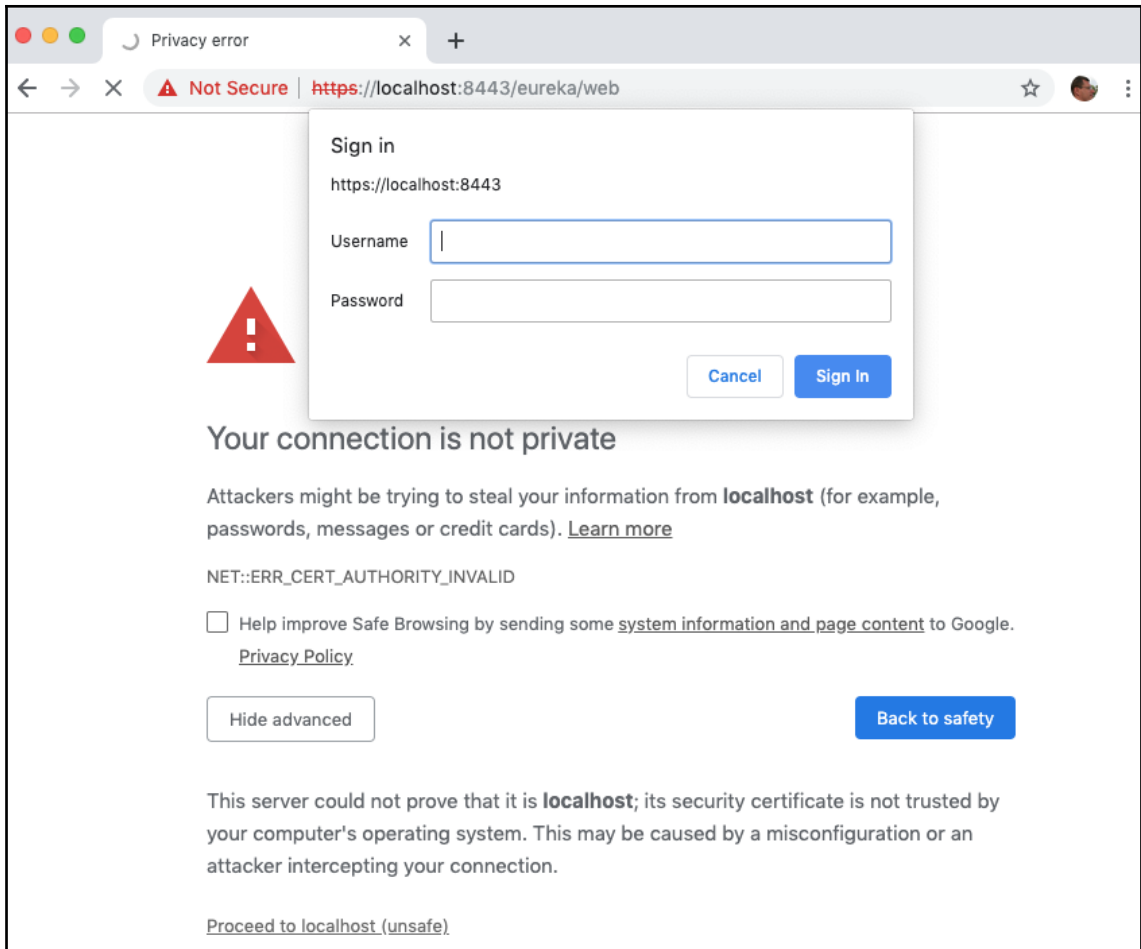
Instances currently registered with Eureka

Application	AMIs	Availability Zones	Status
GATEWAY	n/a (1)	(1)	UP (1) - b91cde7148d9:gateway:8080
PRODUCT	n/a (1)	(1)	UP (1) - 7c9a92146991:product:8080
PRODUCT-COMPOSITE	n/a (1)	(1)	UP (1) - b8013440aea0:product-composite:8080
RECOMMENDATION	n/a (1)	(1)	UP (1) - ffcdbb9f32a4:recommendation:8080
REVIEW	n/a (1)	(1)	UP (1) - 21668e72a668:review:8080

Chapter 11: Securing Access to APIs

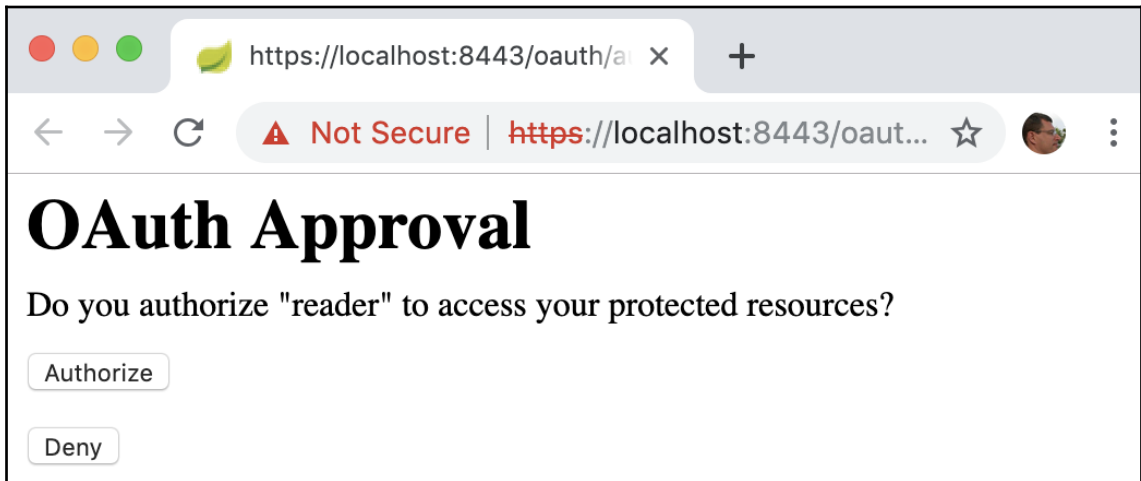
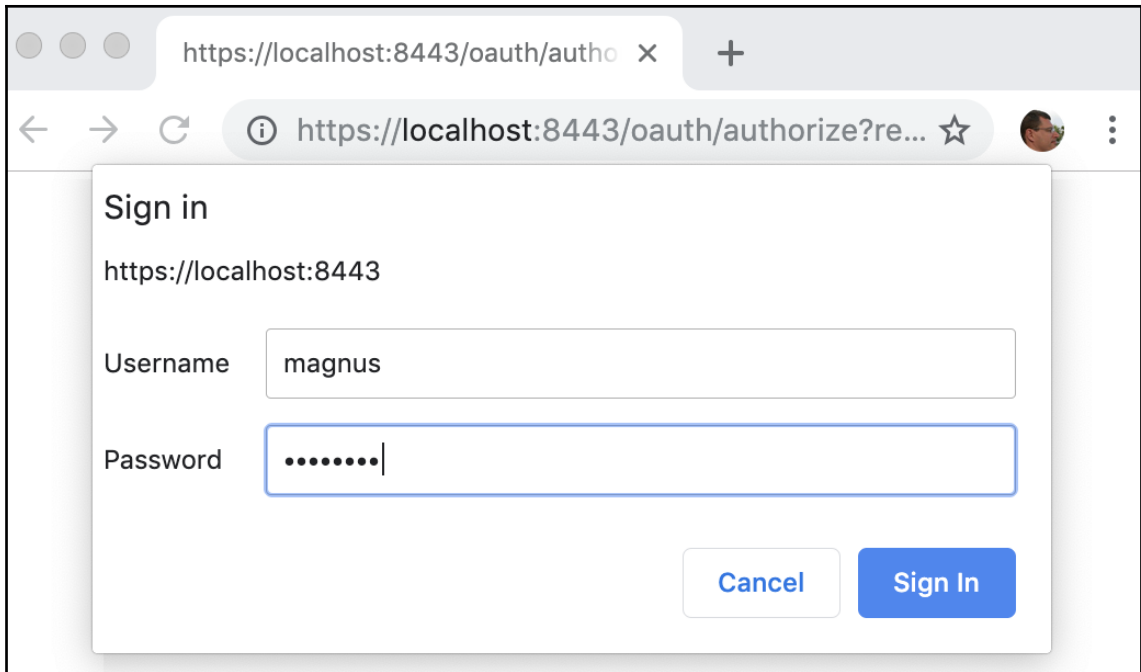


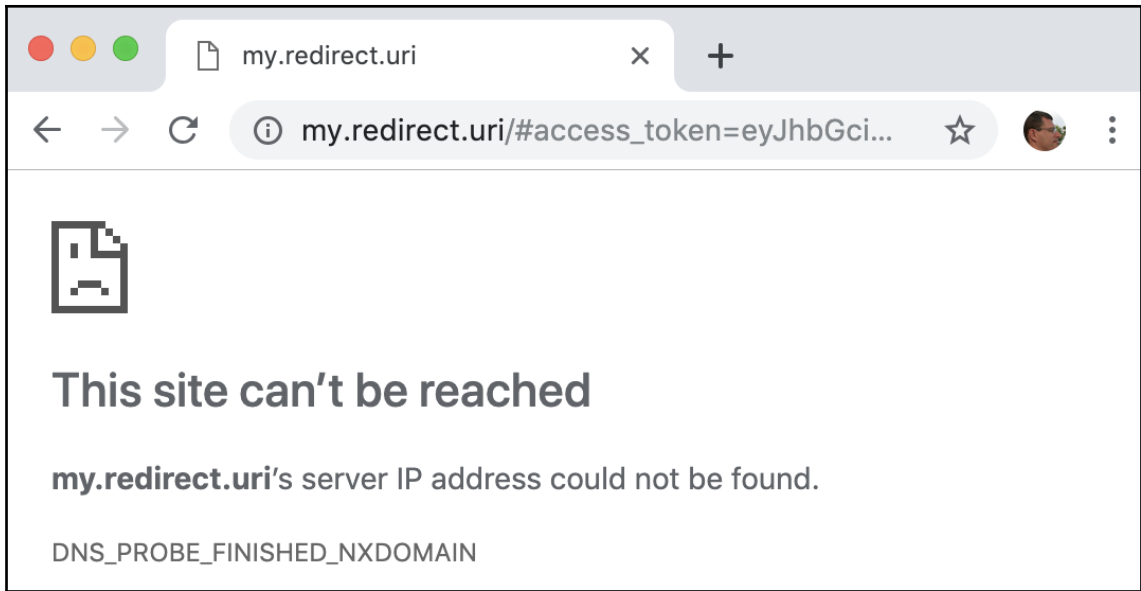




Application	AMIs	Availability Zones	Status
AUTH-SERVER	n/a (1)	(1)	UP (1) - 1fbb5fcd7864:auth-server:9999
GATEWAY	n/a (1)	(1)	UP (1) - abe7ee8d450c:gateway:8443
PRODUCT	n/a (1)	(1)	UP (1) - 9975baef8ae7:product:8080
PRODUCT-COMPOSITE	n/a (1)	(1)	UP (1) - 6cdb02a5ad71:product-composite:8080
RECOMMENDATION	n/a (1)	(1)	UP (1) - d300f3e31c1f:recommendation:8080
REVIEW	n/a (1)	(1)	UP (1) - e7b8ac60ae6e:review:8080

```
{
  "access_token": "eyJ...SyIlQ",
  "token_type": "bearer",
  "expires_in": 599999999,
  "scope": "product:read product:write",
  "jti": "57502ce2-d325-4ffc-98cb-5dcccc0a53df"
}
$
```





```
2. @700dd0df9ffe:/ (bash)
{
  "access_token": "eyJh...KUBA",
  "token_type": "bearer",
  "expires_in": 599999999,
  "scope": "product:read",
  "jti": "998764d2-b940-4aeb-b381-bbfd37c84282"
}
$
```

```
2. @700dd0df9ffe:/ (bash)
HTTP/1.1 401 Unauthorized
WWW-Authenticate: Bearer error="invalid_token"
$
```

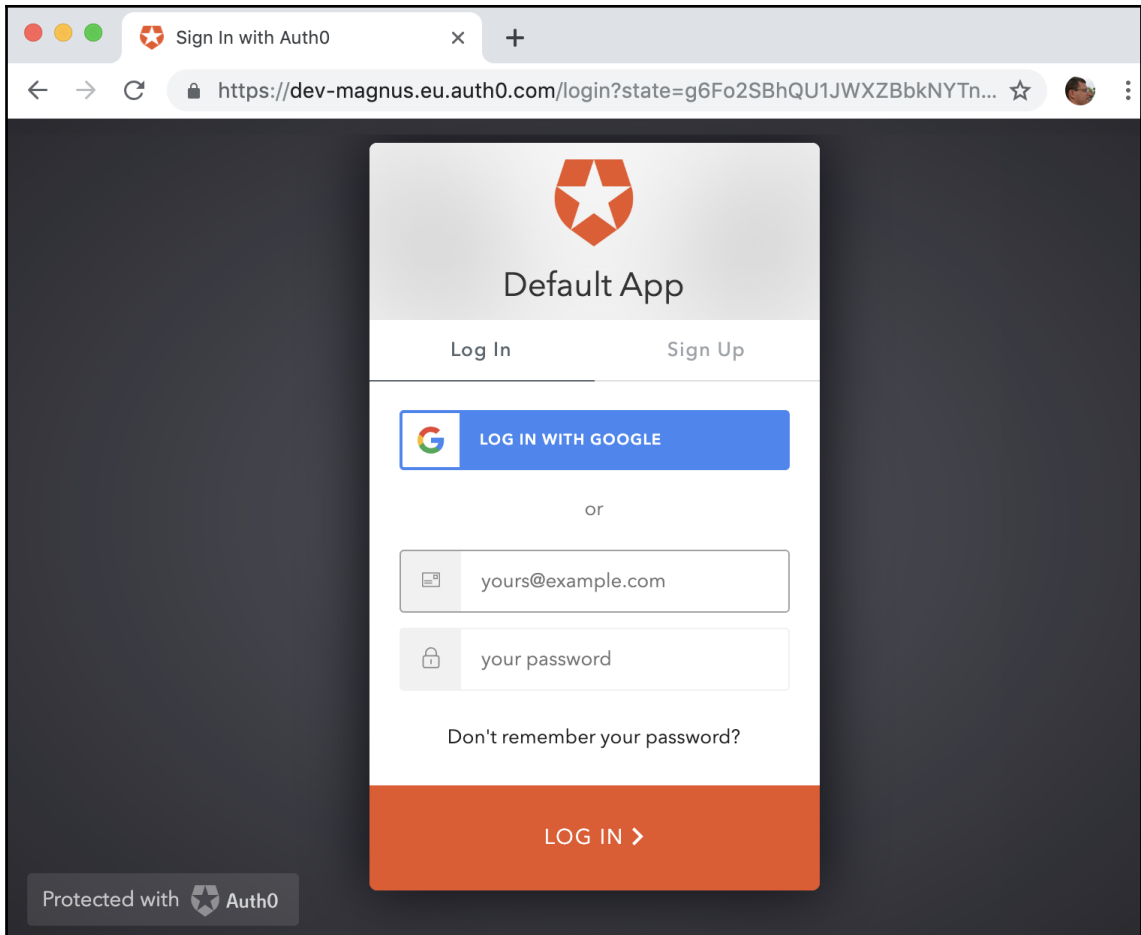
```
2. @700dd0df9ffe:/ (bash)
HTTP/1.1 200 OK
...
{"productId":2, ...}
$ █
```

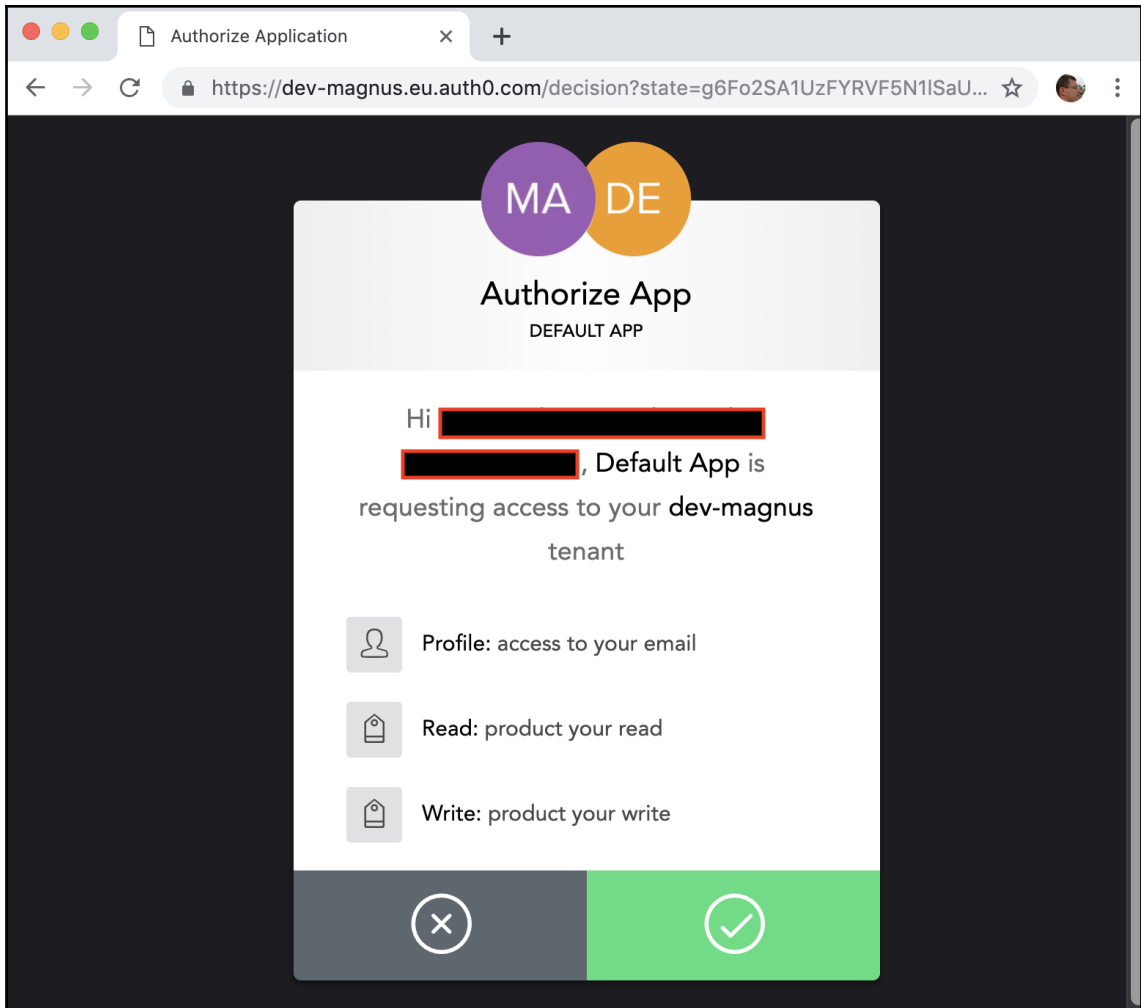
```
2. @700dd0df9ffe:/ (bash)
HTTP/1.1 403 Forbidden
WWW-Authenticate: Bearer error="insufficient_scope",
error_description="The token provided has insufficient scope [product:read] for this request",
error_uri="https://tools.ietf.org/html/rfc6750#section-3.1", scope="product:read"
$ █
```

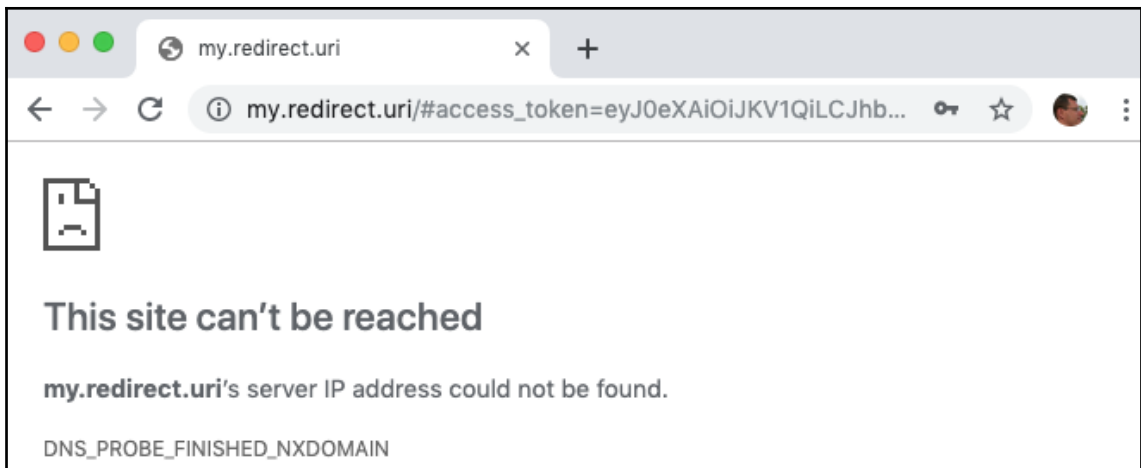
```
2. @700dd0df9ffe:/ (bash)
product-composite_1 ...
Authorization info: Subject: magnus, scopes: ["product:read","product:write"],
expires Tue Apr 13 06:36:41 UTC 2038: issuer: null, audience: null
```

```
2. @700dd0df9ffe:/ (bash)
product-composite_1 ...
Authorization info: Subject: auth0|5ca0b73c97f31e11bc85a5e6,
scopes: openid email product:read product:write,
expires Mon Apr 08 10:46:35 UTC 2019: issuer: https://dev-ml.eu.auth0.com/,
audience: [https://localhost:8443/product-composite, https://dev-ml.eu.auth0.com/userinfo]
```

```
2. @700dd0df9ffe:/ (bash)
product-composite_1 ...
Authorization info: Subject: auth0|5ca0b73c97f31e11bc85a5e6,
scopes: openid email product:read,
expires Mon Apr 08 10:46:41 UTC 2019: issuer: https://dev-ml.eu.auth0.com/,
audience: [https://localhost:8443/product-composite, https://dev-ml.eu.auth0.com/userinfo]
```

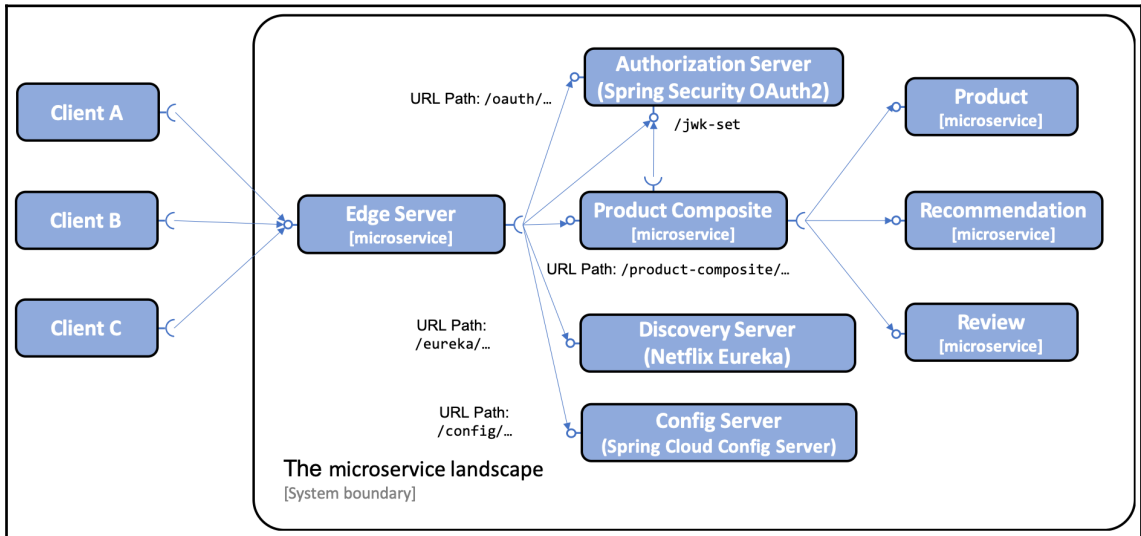






```
2. @700dd0df9ffe:/ (bash)
{
  "sub": "auth0|...",
  "email": "...my email...",
  "email_verified": true
}
$
```

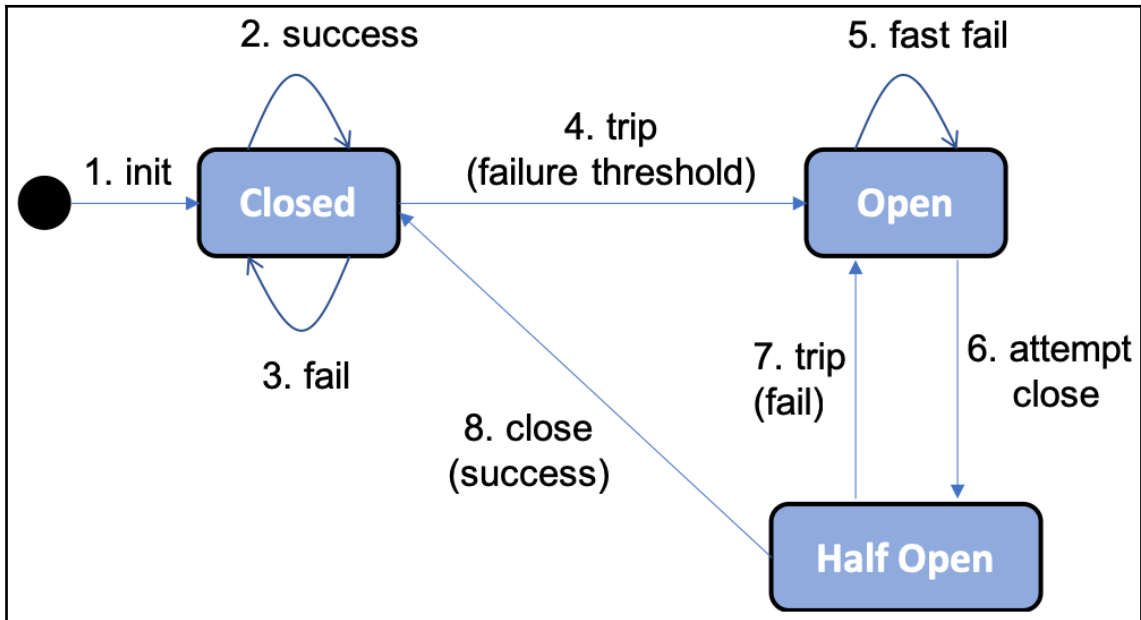
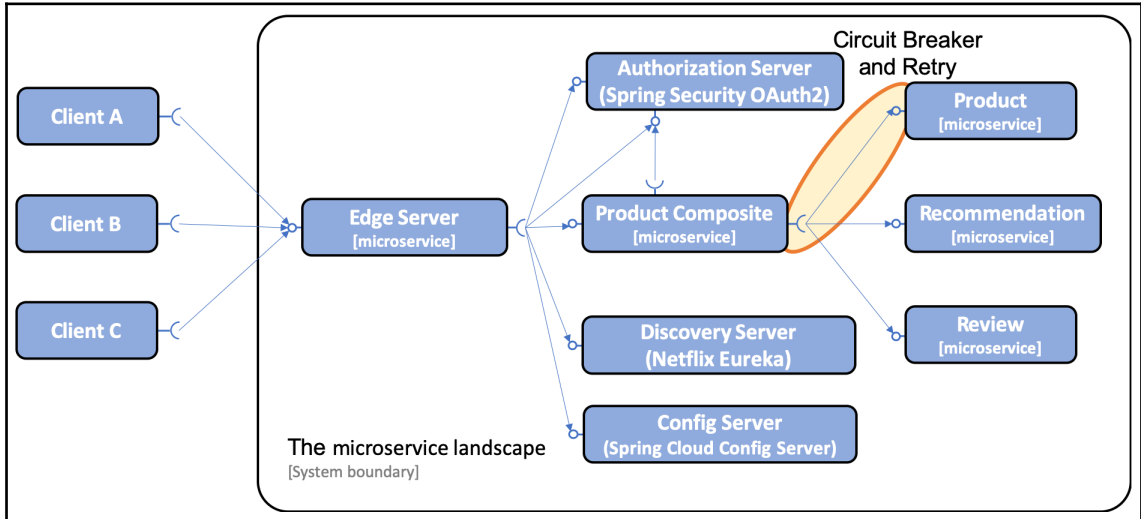
Chapter 12: Centralized Configuration



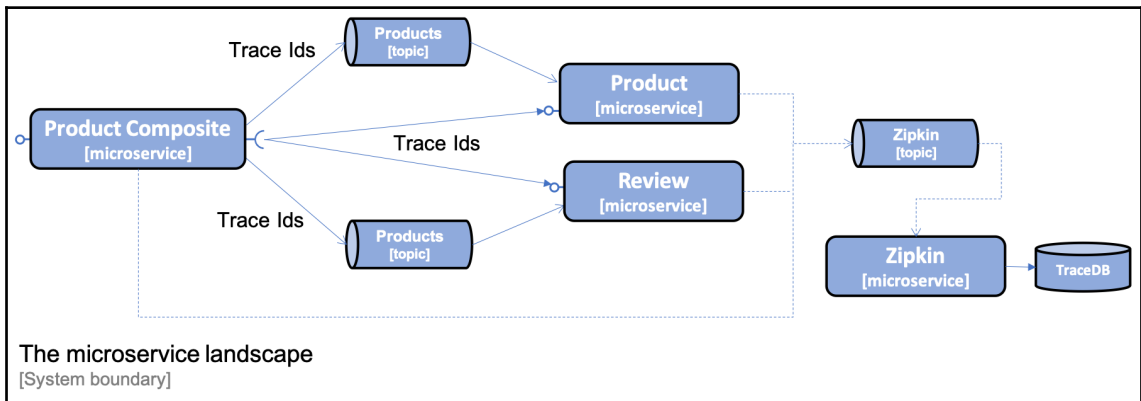
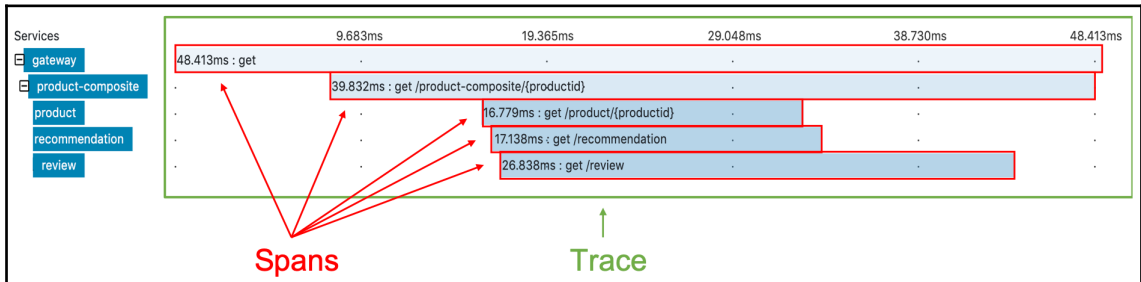
```
2. bash
9eca39e823957f37f0f0f4d8b2c6c46cd49ef461d1cab20c65710823a8b412ce
$
```

```
2. bash
hello world
$
```


Chapter 13: Improving Resilience Using Resilience4j



Chapter 14: Understanding Distributed Tracing



Zipkin - Index

localhost:9411/zipkin/?serviceName=gateway&spanName=all&lookback=3600000&startTs=1557651922641&endTs=1557655522641&annotati...

Investigate system behavior Find a trace View Saved Trace Dependencies Try Lens UI Go to trace Search

1 Service Name gateway Span Name all Lookback 1 hour

Annotation Query For example: http.path=/foo/bar/ and cluster=foo and cache.miss Duration (μs) >= Ex: 100ms or 5s Limit 10 Sort 2 Newest First

3 Find Traces ?

Showing: 10 of 10 Services: gateway JSON

48.413ms 10 spans gateway 100% gateway x2 48.413ms product-composite x4 36.692ms review x2 20.169ms product x1 14.399ms recommendation x1 13.139ms 5 minutes ago

98.794ms 3 spans gateway 100% gateway x2 98.794ms auth-server x1 85.091ms 5 minutes ago

74.756ms 10 spans gateway 100% gateway x2 74.756ms product-composite x4 60.569ms review x2 35.249ms product x1 22.712ms recommendation x1 15.509ms 10 minutes ago

Zipkin - Traces

localhost:9411/zipkin/traces/9dfadf96df5afc40

Investigate system behavior Find a trace View Saved Trace Dependencies Try Lens UI Go to trace Search

Duration: 48.413ms Services: 5 Depth: 4 Total Spans: 6 JSON

Expand All Collapse All

gateway x2 product x1 product-composite x4 recommendation x1 review x2

Services	9.683ms	19.365ms	29.048ms	38.730ms	48.413ms
gateway	48.413ms : get	-	-	-	-
product-composite	-	39.832ms : get /product-composite/(productid)	-	-	-
product	-	-	16.779ms : get /product/(productid)	-	-
recommendation	-	-	17.138ms : get /recommendation	-	-
review	-	-	26.838ms : get /review	-	-
review	-	-	-	-	2.524ms : async

gateway.get: 48.413ms



Services: gateway

Date Time	Relative Time	Annotation	Address
12/05/2019, 12:04:29		Server Start	192.168.176.2 (gateway)
12/05/2019, 12:04:29	48.413ms	Server Finish	192.168.176.2 (gateway)

Key	Value
http.method	GET
http.path	/product-composite/2

Show IDs

Zipkin - Index

localhost:9411/zipkin/?serviceName=gateway&spanName=all&lookback=3600000&startTs=1557652438233&endTs=1557656038233&annotat...

ZIPKIN

Investigate system behavior

Find a trace

View Saved Trace

Dependencies

Try Lens UI

Go to trace

Search

Service Name

gateway

Span Name

all

Lookback

1 hour

Annotation Query

For example: http.path=/foo/bar/ and cluster=foo and cache.miss

Duration (µs) >=

Ex: 100ms or 5s

Limit

10

Sort

Newest First

Find Traces

?

Showing: 10 of 10

Services: gateway

JSON

60.621ms 10 spans

gateway 100%

gateway x2 60.621ms product-composite x4 40.590ms product x1 26.979ms review x2 16.431ms recommendation x1 15.952ms

less than a minute ago

48.413ms 10 spans

gateway 100%

gateway x2 48.413ms product-composite x4 36.692ms review x2 20.169ms product x1 14.399ms recommendation x1 13.139ms

14 minutes ago

98.794ms 3 spans

gateway 100%

gateway x2 98.794ms auth-server x1 85.091ms

14 minutes ago

localhost:9411/zipkin/traces/9dfad96df5afc40

Zipkin - Traces

localhost:9411/zipkin/traces/124a1235c1b8caeb

ZIPKIN

Investigate system behavior

Find a trace

View Saved Trace

Dependencies

Try Lens UI

Go to trace

Search

Duration: 60.621ms Services: 6 Depth: 4 Total Spans: 6

JSON

Expand All

Collapse All

gateway x2 product x1 product-composite x4 recommendation x1 review x2

Services	12.124ms	24.248ms	36.373ms	48.497ms	60.621ms
gateway	60.621ms : get	-	-	-	-
product-composite	-	43.648ms : get /product-composite/(productid)	-	-	-
product	-	-	30.671ms : get /product/(productid)	-	-
recommendation	-	-	20.685ms : get /recommendation	-	-
review	-	-	21.808ms : get /review	-	-
review	-	-	-	1.453ms : async	-

Zipkin - Traces

localhost:9411/zipkin/traces/124a1235c1b8caeb

ZIPKIN Investigate

Duration: 60.621ms

Expand All Collapse All

gateway x2 product x1

Services

- gateway
- product-composite
 - product
 - recommendation
 - review
 - review

product.get /product/{productid}: 30.671ms

Services: product,product-composite

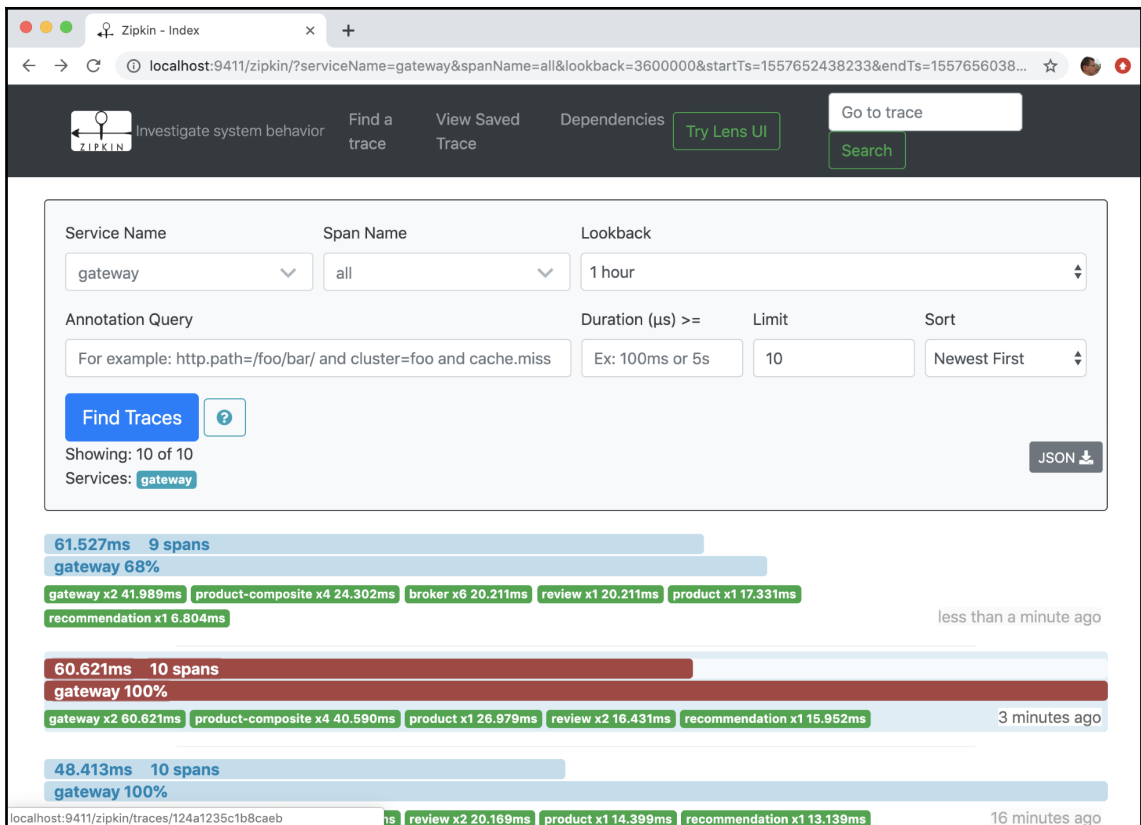
Date Time	Relative Time	Annotation	Address
12/05/2019, 12:18:15	22.953ms	Client Start	192.168.176.11 (product-composite)
12/05/2019, 12:18:15	27ms	Server Start	192.168.176.9 (product)
12/05/2019, 12:18:15	53.624ms	Client Finish	192.168.176.11 (product-composite)
12/05/2019, 12:18:15	53.979ms	Server Finish	192.168.176.9 (product)

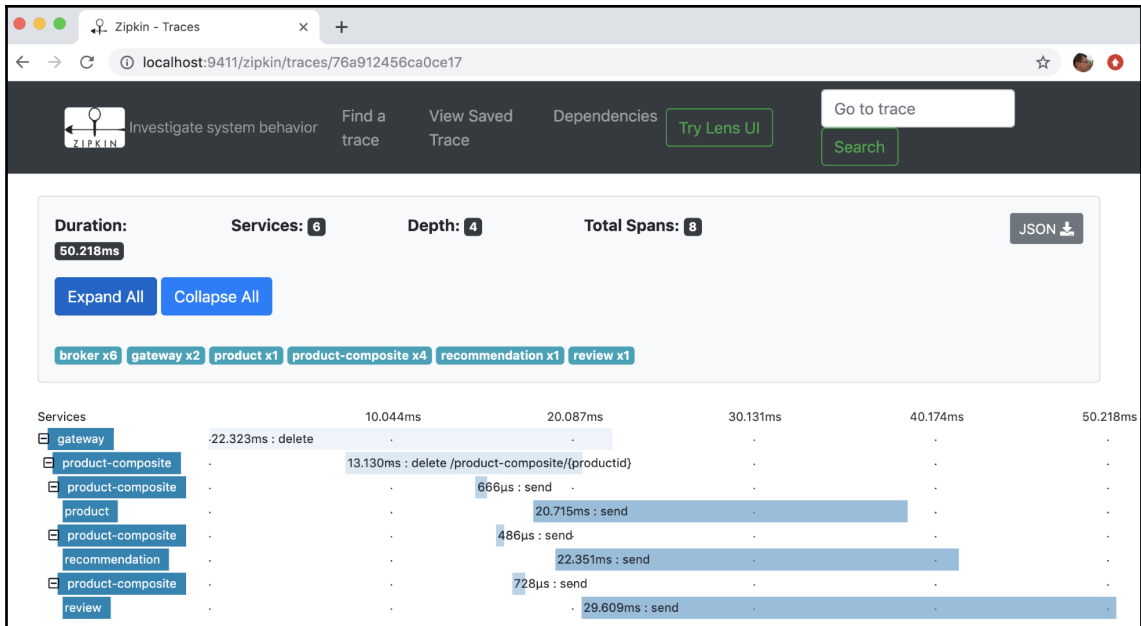
Key	Value
error	Status code of the response is [404] and the reason is [Not Found]
http.method	GET
http.path	/product/12345
http.status_code	404
error	404
mvc.controller.class	ProductServiceImpl
mvc.controller.method	getProduct

Show IDs

JSON

60.621ms





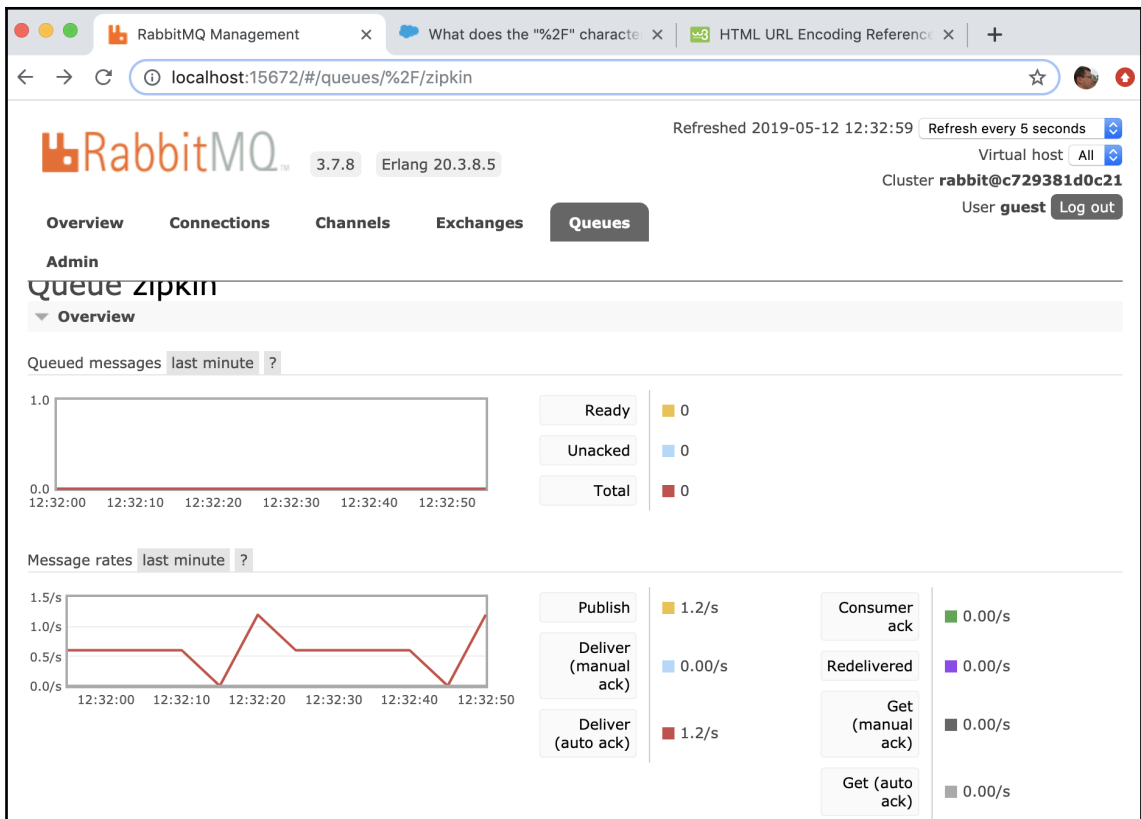
product.send: 20.715ms

Services: broker,product

Date Time	Relative Time	Annotation	Address
12/05/2019, 12:21:08	17.945ms	Producer Start	192.168.176.9 (product)
12/05/2019, 12:21:08	38.660ms	Producer Finish	192.168.176.9 (product)

Key	Value
channel	input
Broker Address	broker

Show IDs

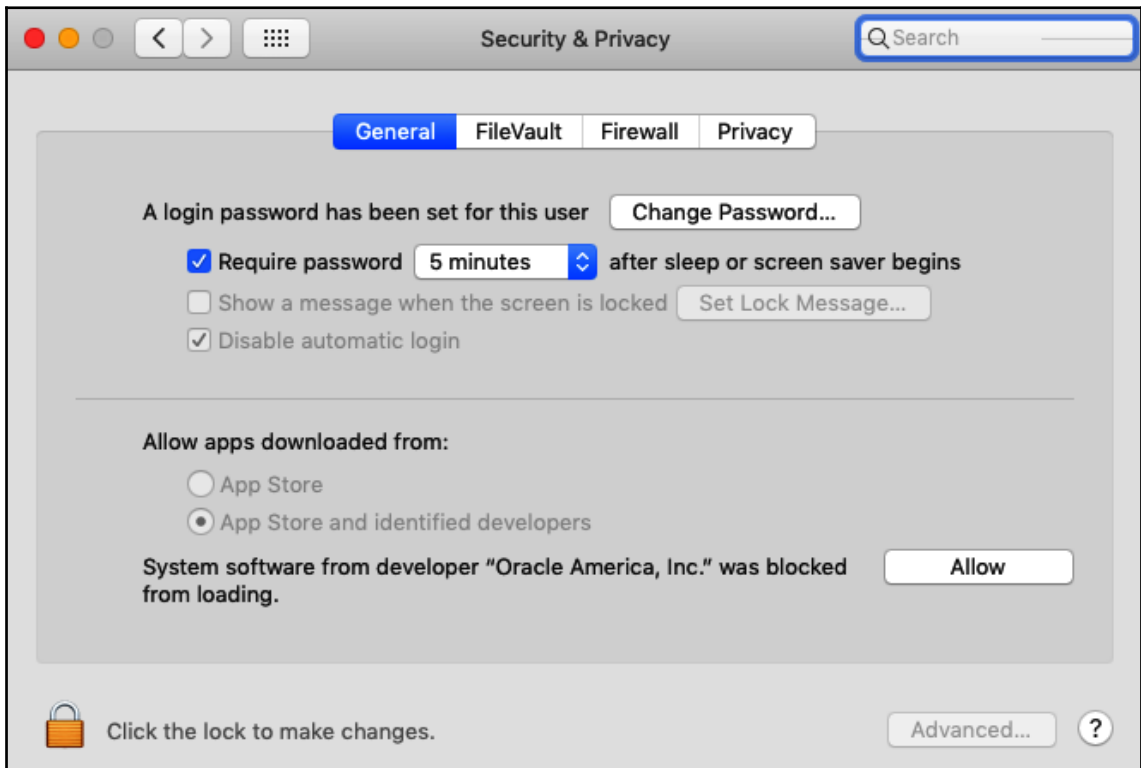
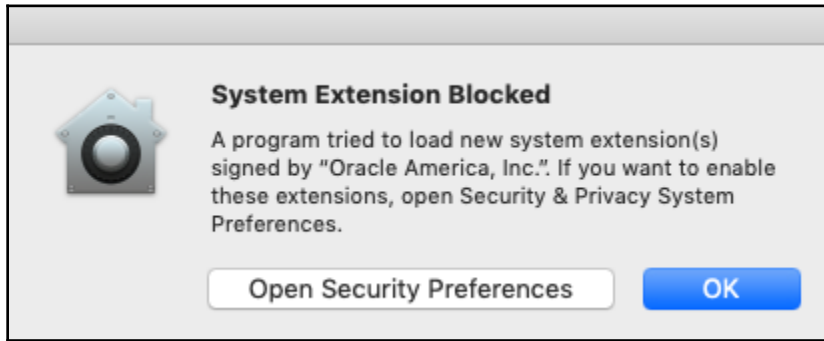


```
2. bash
(bash)
$ docker-compose exec kafka /opt/kafka/bin/kafka-topics.sh --zookeeper zookeeper --list
__consumer_offsets
error.products.productsGroup
error.recommendations.recommendationsGroup
error.reviews.reviewsGroup
products
recommendations
reviews
zipkin
$
```

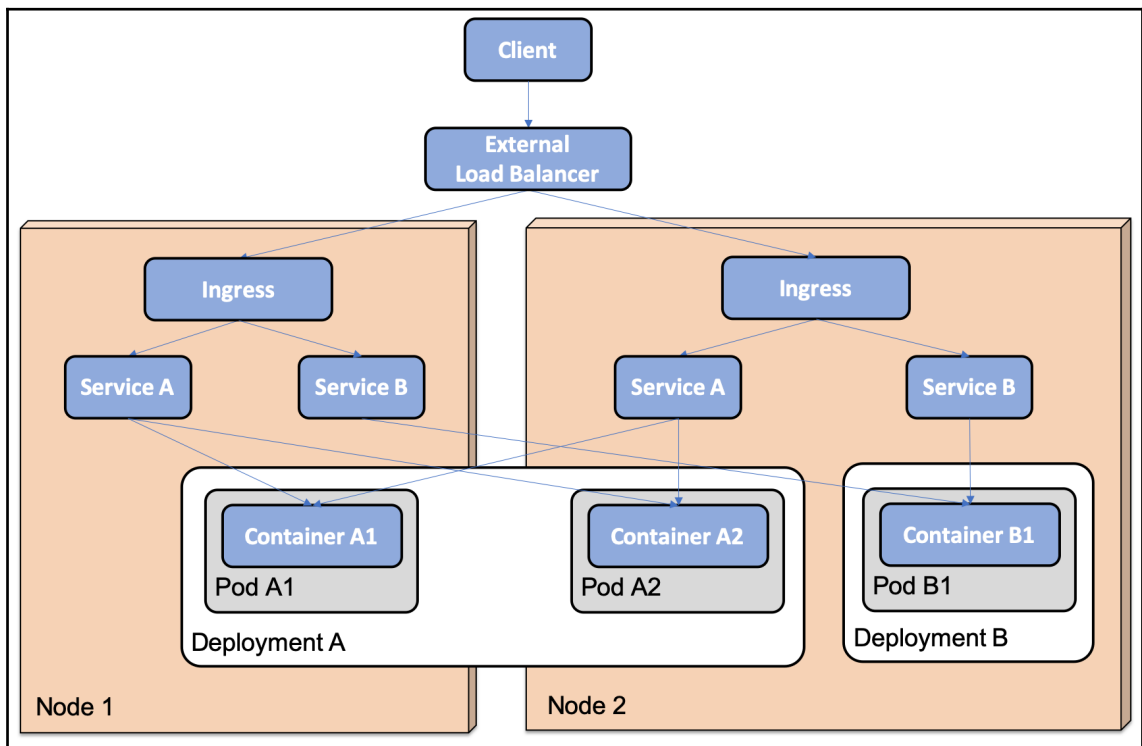
```
2. bash
$ docker-compose exec kafka /opt/kafka/bin/kafka-console-consumer.sh --bootstrap-server localhost:9092 --topic zipkin --from-beginning --timeout-ms 1000

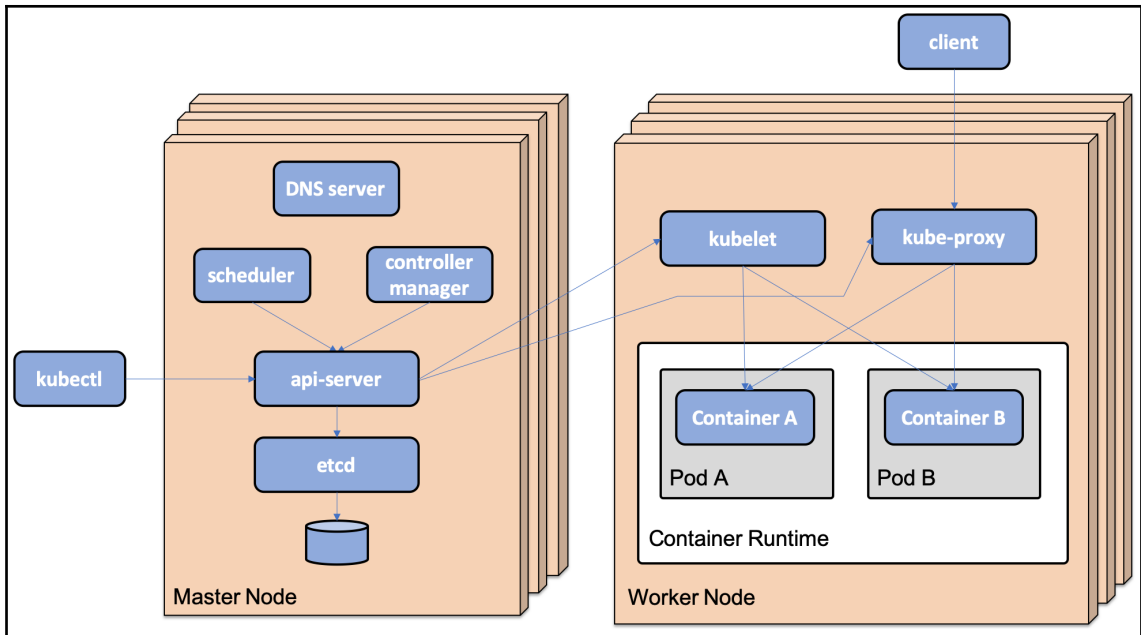
[{"traceId":"87e49c2ca6333a83","id":"87e49c2ca6333a83","kind":"SERVER","name":"put","timestamp":155765757350749,"duration":432812,"localEndpoint":{"serviceName":"eureka-server","ipv4":"192.168.192.3"},"remoteEndpoint":{"ipv4":"192.168.192.7","port":38956},"tags":{"error":"404","http.method":"PUT","http.path":"/eureka/apps/GATEWAY/2a4a7bb3f032:gateway:8443","http.status_code":"404"}},{"traceId":"54f10f2c563ce308","id":"54f10f2c563ce308","kind":"SERVER","name":"get","timestamp":155765757352296,"duration":494911,"localEndpoint":{"serviceName":"eureka-server","ipv4":"192.168.192.3"},"remoteEndpoint":{"ipv4":"192.168.192.7","port":38958},"tags":{"http.method":"GET","http.path":"/eureka/apps/"}},{"traceId":"ba52a603efd2ef98","id":"ba52a603efd2ef98","kind":"SERVER","name":"get","timestamp":155765757333640,"duration":514823,"localEndpoint":{"serviceName":"eureka-server","ipv4":"192.168.192.3"},"remoteEndpoint":{"ipv4":"192.168.192.15","port":41358},"tags":{"http.method":"GET","http.path":"/eureka/apps/"}},{"traceId":"20a3b95d4be04bc4","id":"20a3b95d4be04bc4","kind":"SERVER","name":"get","timestamp":1557657577622946,"duration":208980,"localEndpoint":{"serviceName":"eureka-server","ipv4":"192.168.192.3"},"remoteEndpoint":{"ipv4":"192.168.192.13","port":36566},"tags":{"http.method":"GET","http.path":"/eureka/apps/"}},{"traceId":"ef73ef97be3758bc","id":"ef73ef97be3758bc","kind":"SERVER","name":"get","timestamp":1557657577335869,"duration":504535,"localEndpoint":{"serviceName":"eureka-server","ipv4":"192.168.192.3"},"remoteEndpoint":{"ipv4":"192.168.192.12","port":38070},"tags":{"http.method":"GET","http.path":"/eureka/apps/"}},{"traceId":"bb0a245c5c510805","id":"bb0a245c5c510805","kind":"SERVER","name":"get","timestamp":1557657577349693,"duration":498702,"localEndpoint":{"serviceName":"eureka-server","ipv4":"192.168.192.3"},"remoteEndpoint":{"ipv4":"192.168.192.8","port":41876},"tags":{"http.method":"GET","http.path":"/eureka/apps/"}},{"traceId":"add4c15c9896e13a","id":"add4c15c9896e13a","kind":"SERVER","name":"get","timestamp":1557657577974841,"duration":13210,"localEndpoint":{"serviceName":"eureka-server","ipv4":"192.168.192.3"},"remoteEndpoint":{"ipv4":"192.168.192.14","port":46750},"tags":{"http.method":"GET","http.path":"/eureka/apps/"}]}
...
$
```

Chapter 15: Introduction to Kubernetes



```
3. bash
$ kubectl version --client --short
Client Version: v1.15.0
$ minikube version
minikube version: v1.2.0
$ vboxmanage --version
6.0.6r130049
$
```





```
8. bash
$ kubectl config get-contexts
CURRENT  NAME                                CLUSTER             AUTHINFO             NAMESPACE
*        handson-spring-boot-cloud          handson-spring-boot handson-spring-boot  first-attempts
         minikube                     minikube             minikube
```

```
8. bash
$ kubectl get nodes
NAME          STATUS    ROLES    AGE   VERSION
minikube     Ready    master   3m10s v1.14.1
$
```

```
8. bash
$ kubectl get pods --namespace=kube-system
```

NAME	READY	STATUS	RESTARTS	AGE
coredns-fb8b8dccb-2fbkp	1/1	Running	0	3m4s
coredns-fb8b8dccb-chctl	1/1	Running	0	3m4s
default-http-backend-6864bbb7db-wdb62	1/1	Running	0	3m4s
etcd-minikube	1/1	Running	0	2m12s
kube-addon-manager-minikube	1/1	Running	0	2m1s
kube-apiserver-minikube	1/1	Running	0	2m11s
kube-controller-manager-minikube	1/1	Running	0	119s
kube-proxy-dmhsh	1/1	Running	0	3m5s
kube-scheduler-minikube	1/1	Running	0	118s
nginx-ingress-controller-586cdc477c-rctnr	1/1	Running	0	3m3s
storage-provisioner	1/1	Running	0	3m4s

```
$
```

```
8. bash
$ kubectl get all
```

NAME	READY	STATUS	RESTARTS	AGE
pod/nginx-deploy-59b8c5f7cd-mt6pg	1/1	Running	0	8s

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
deployment.apps/nginx-deploy	1/1	1	1	8s

NAME	DESIRED	CURRENT	READY	AGE
replicaset.apps/nginx-deploy-59b8c5f7cd	1	1	1	8s

```
$
```

```
8. bash
$ kubectl get all
NAME                                READY   STATUS    RESTARTS   AGE
pod/nginx-deploy-59b8c5f7cd-mt6pg   1/1     Running   0           46s
pod/nginx-deploy-59b8c5f7cd-pmns9   1/1     Running   0           12s
pod/nginx-deploy-59b8c5f7cd-vtstj   1/1     Running   0           12s

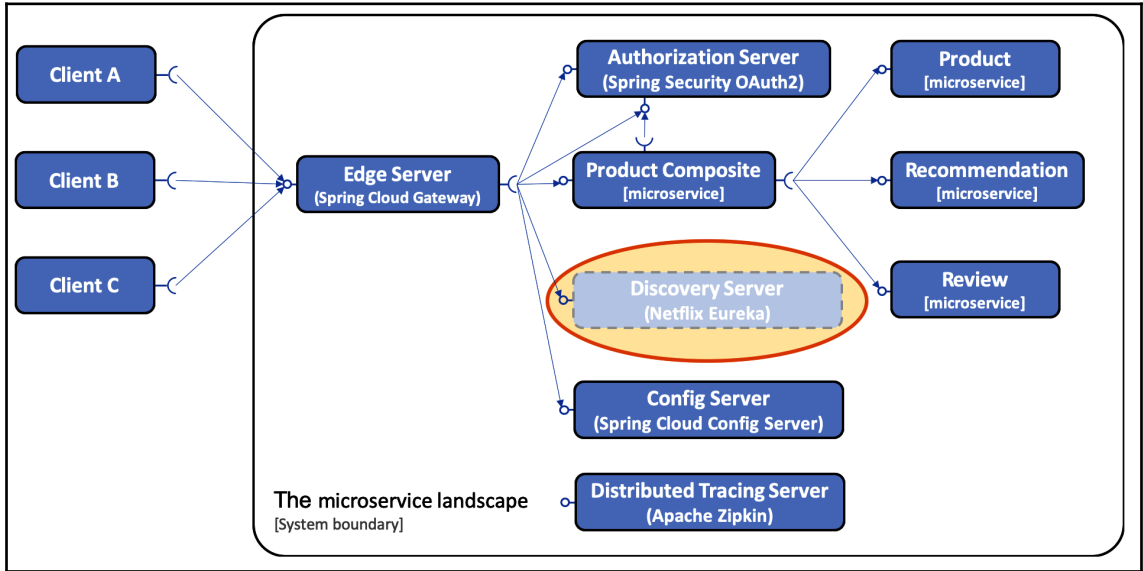
NAME                                READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/nginx-deploy        3/3     3             3           46s

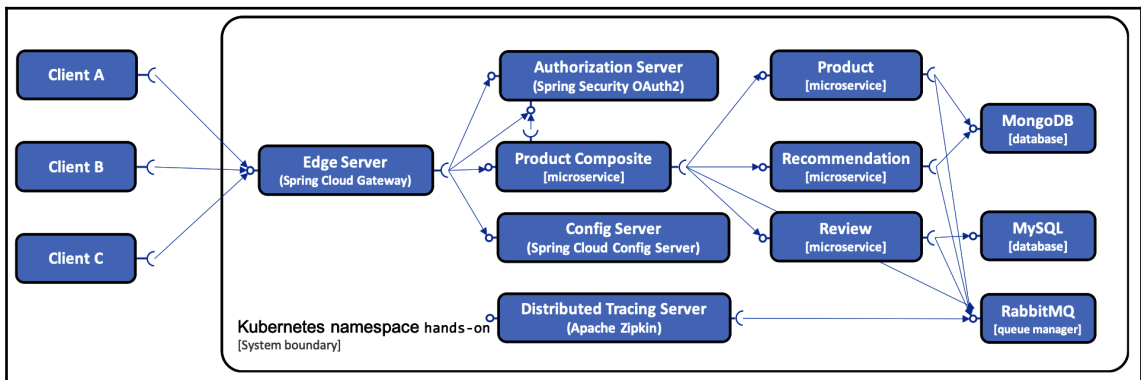
NAME                                DESIRED   CURRENT   READY   AGE
replicaset.apps/nginx-deploy-59b8c5f7cd 3         3         3       46s
$
```

```
8. bash
$ kubectl get svc
NAME            TYPE        CLUSTER-IP    EXTERNAL-IP    PORT(S)          AGE
nginx-service   NodePort    10.111.232.48 <none>         80:30080/TCP    56m
$
```



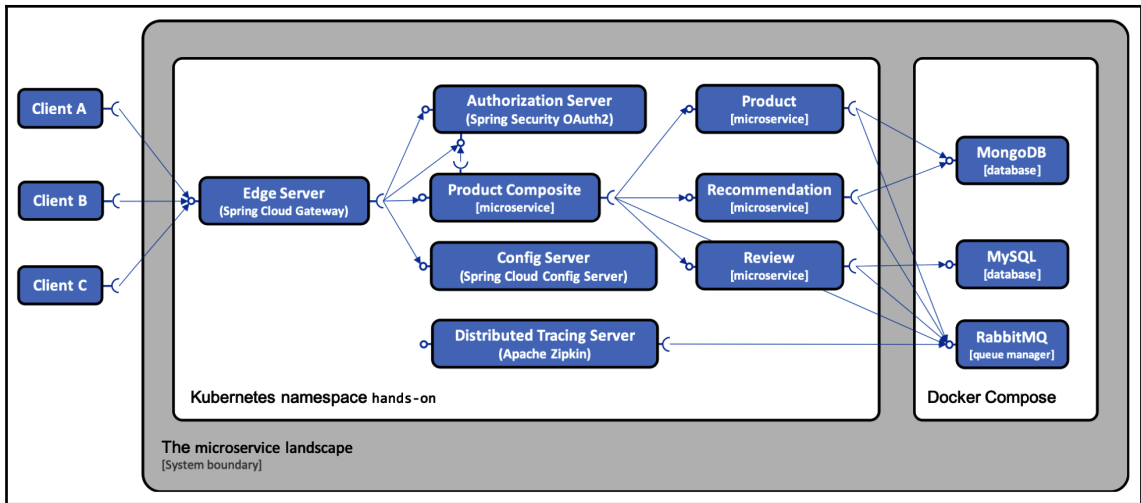
```
8. bash
$ cat run-curl.txt
$ kubectl run -i --rm --restart=Never curl-client --image=tutum/curl:alpine --command -- curl -s 'http://nginx-service:80'
...
<h1>Welcome to nginx!</h1>
...
pod "curl-client" deleted
$
```



```
8. bash
$ kubectl get pods -o json | jq .items[].spec.containers[].image
"hands-on/auth-server"
"hands-on/config-server"
"hands-on/gateway"
"mongo:3.6.9"
"mysql:5.7"
"hands-on/product-service"
"hands-on/product-composite-service"
"rabbitmq:3-management"
"hands-on/recommendation-service"
"hands-on/review-service"
"openzipkin/zipkin:2.12.9"
$
```

```
3. bash
$ HOST=$(minikube ip) PORT=31443 ./test-em-all.bash
Start Tests: Sat Jun 29 08:29:05 CEST 2019
HOST=192.168.99.116
PORT=31443
Wait for: curl -k https://192.168.99.116:31443/actuator/health... DONE, continues...
Test OK (HTTP Code: 200)
...
Start Circuit Breaker tests!
Restarting alpine-client...
Error from server (NotFound): pods "alpine-client" not found
pod/alpine-client created
Waiting for alpine-client to be ready...
pod/alpine-client condition met
Test OK (actual value: CLOSED)
...
Test OK (actual value: HALF_OPEN_TO_CLOSED)
pod "alpine-client" deleted
End, all tests OK: Sat Jun 29 08:29:33 CEST 2019
$
```



```

8. bash
$ kubectl get pods -o json | jq .items[].spec.containers[].image
"hands-on/auth-server:v1"
"hands-on/config-server:v1"
"hands-on/gateway:v1"
"hands-on/product-composite-service:v1"
"hands-on/product-service:v1"
"hands-on/recommendation-service:v1"
"hands-on/review-service:v1"
"openzipkin/zipkin:2.12.9"
$

```

```

8. bash
$ kubectl get pod -l app=product -o jsonpath='{.items[*].spec.containers[*].image}'
hands-on/product-service:v1
$

```

```
8. bash
$ siege https://$(minikube ip):31443/actuator/health -d1 -c1
...
HTTP/1.1 200      0.03 secs:      920 bytes ==> GET  /actuator/health
HTTP/1.1 200      0.02 secs:      920 bytes ==> GET  /actuator/health
HTTP/1.1 200      0.02 secs:      920 bytes ==> GET  /actuator/health
HTTP/1.1 200      0.03 secs:      920 bytes ==> GET  /actuator/health
```

```
8. bash
$ kubectl get pods -l app=product -w
NAME                                READY   STATUS             RESTARTS   AGE
product-5d45f8bcd-ffrdh             1/1     Running            0          20s
product-d4f789cc-t8mcl              0/1     Pending            0          0s
product-d4f789cc-t8mcl              0/1     Pending            0          0s
product-d4f789cc-t8mcl              0/1     ContainerCreating  0          0s
product-d4f789cc-t8mcl              0/1     Running            0          2s
product-d4f789cc-t8mcl              1/1     Running            0          16s
product-5d45f8bcd-ffrdh             1/1     Terminating      0          2m5s
product-5d45f8bcd-ffrdh             0/1     Terminating      0          2m10s
product-5d45f8bcd-ffrdh             0/1     Terminating      0          2m17s
product-5d45f8bcd-ffrdh             0/1     Terminating      0          2m17s
```

```
8. bash
HTTP/1.1 200      0.02 secs:      920 bytes ==> GET  /actuator/health
HTTP/1.1 503      0.03 secs:     1068 bytes ==> GET  /actuator/health
HTTP/1.1 503      0.03 secs:     1068 bytes ==> GET  /actuator/health
HTTP/1.1 200      0.03 secs:      920 bytes ==> GET  /actuator/health
```

```
8. bash
$ kubectl get pod -l app=product -o jsonpath='{.items[*].spec.containers[*].image}' '
hands-on/product-service:v2 $
```

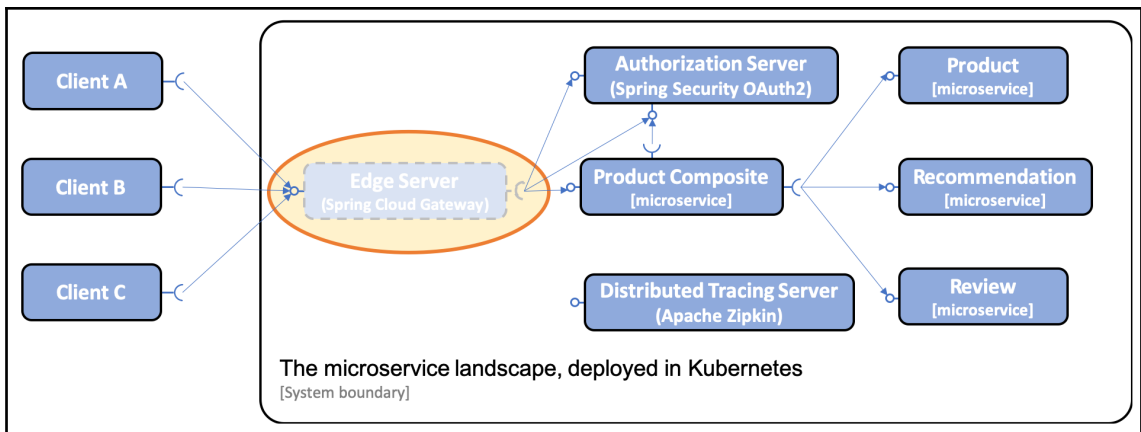
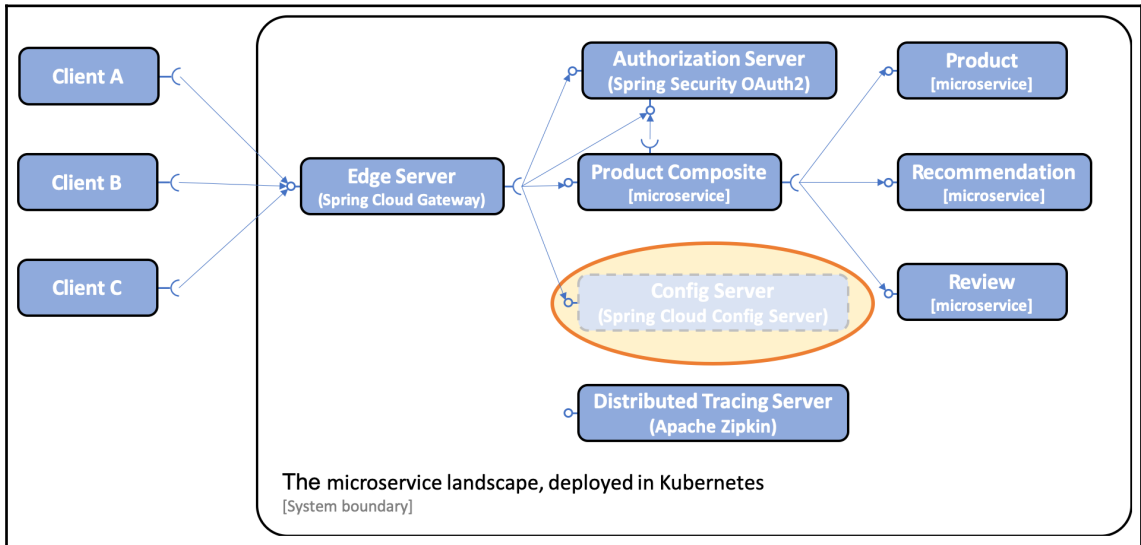
```
8. bash
$ kubectl rollout history deployment product
deployment.extensions/product
REVISION  CHANGE-CAUSE
1          <none>
2          <none>
3          <none>
$
```

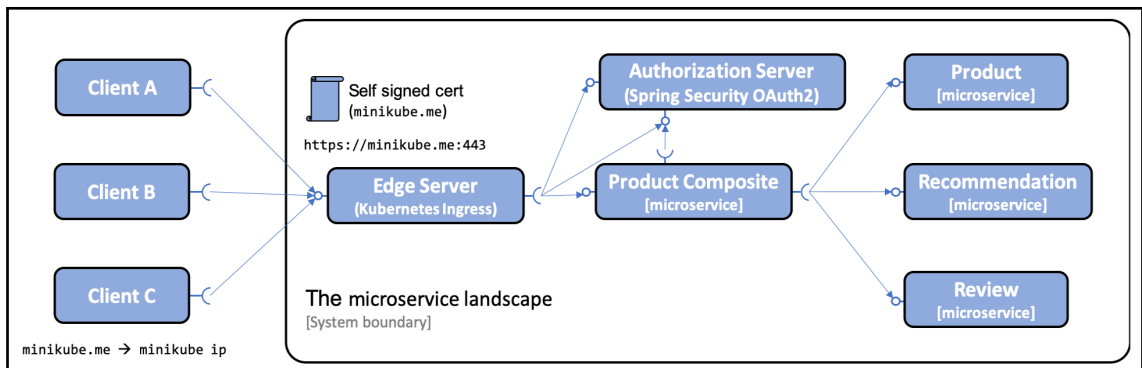
```
8. bash
$ kubectl rollout history deployment product --revision=2
deployment.extensions/product with revision #2
Pod Template:
  Labels:      app=product
              pod-template-hash=d4f789cc
  Containers:
    pro:
      Image:   hands-on/product-service:v2
  ...
$
```

```
8. bash
$ kubectl rollout undo deployment product --to-revision=2
deployment.extensions/product rolled back
$
```

8. bash				
product-7549b597b-m2dtn	0/1	Terminating	0	7m40s
product-7549b597b-m2dtn	0/1	Terminating	0	7m40s
product-7549b597b-m2dtn	0/1	Terminating	0	7m43s
product-7549b597b-m2dtn	0/1	Terminating	0	7m43s

Chapter 17: Implementing Kubernetes Features as an Alternative

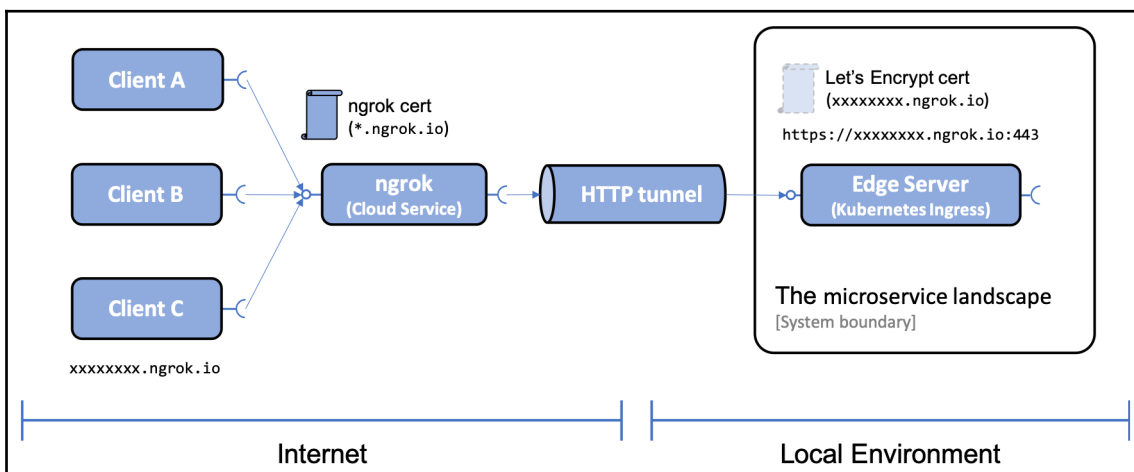


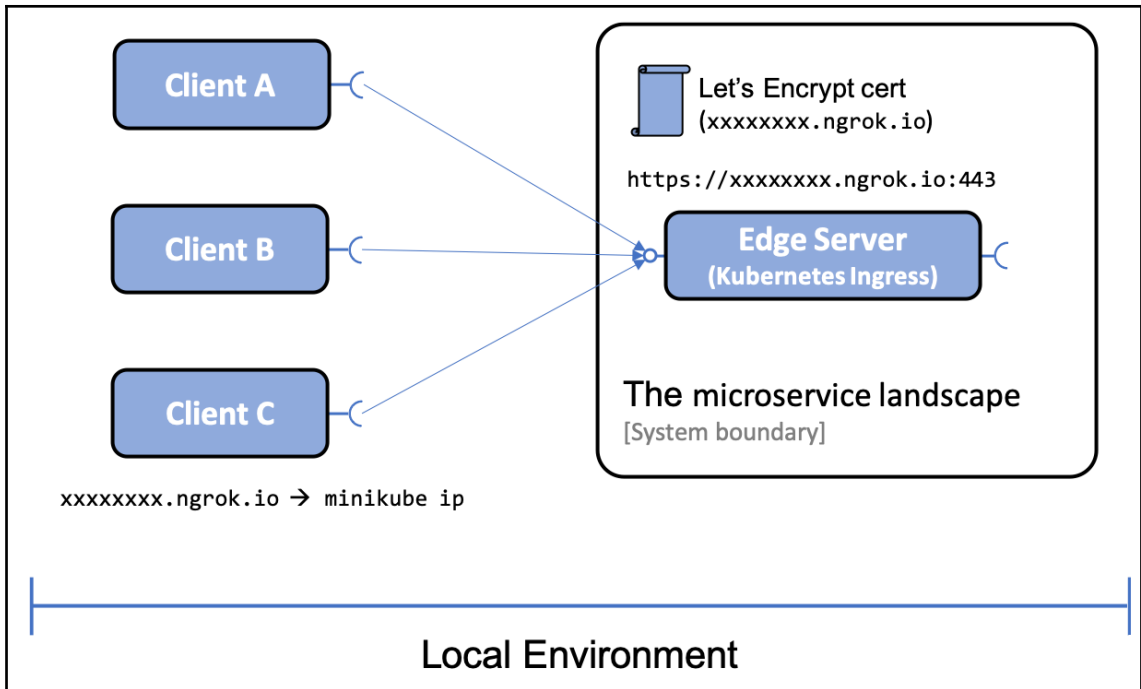


```
3. bash
$ cat /etc/hosts
...
192.168.99.121 minikube.me
$
```

```
3. bash
$ HOST=minikube.me PORT=443 ./test-em-all.bash
Start Tests: Wed Jul 10 13:05:51 CEST 2019
HOST=minikube.me
PORT=443
Wait for: curl -k https://minikube.me:443/actuator/health... DONE, continues...
Test OK (HTTP Code: 200)
...
End, all tests OK: Wed Jul 10 13:06:33 CEST 2019
$
```

```
4. bash
$ kubectl wait --timeout=600s --for=condition=ready pod --all -n cert-manager
pod/cert-manager-5d5cc69d6-5f9wb condition met
pod/cert-manager-cainjector-7688bf9689-9md7k condition met
pod/cert-manager-webhook-dfcbcc64b-vh5qh condition met
$
```

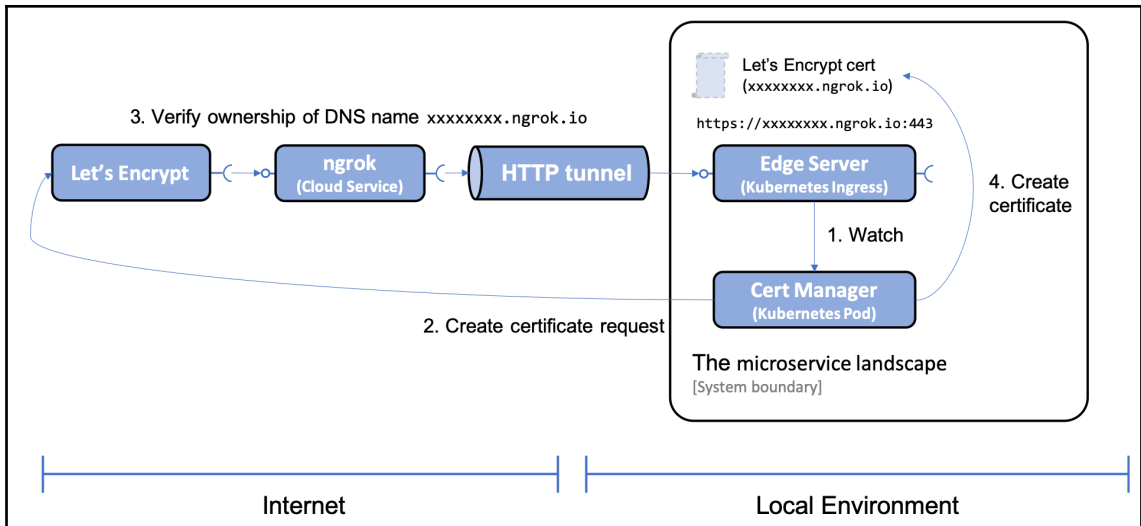




```
3. bash
ngrok by @inconshreveable (Ctrl+C to quit)

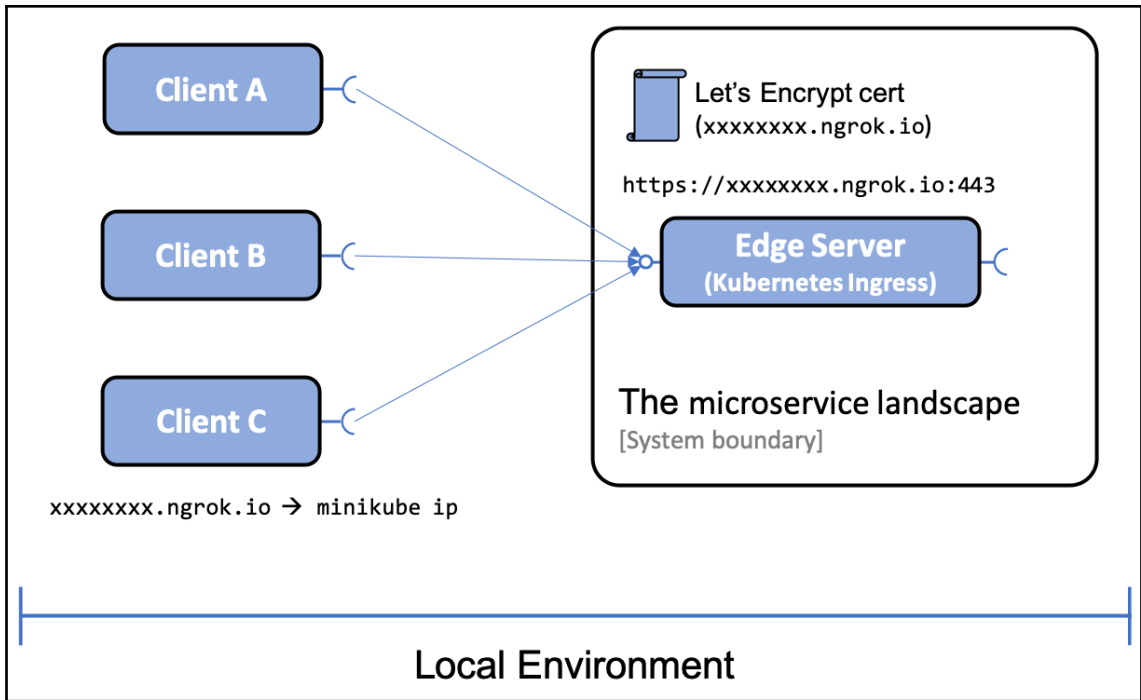
Session Status      online
Account             Magnus Larsson (Plan: Free)
Version             2.3.30
Region              United States (us)
Web Interface        http://127.0.0.1:4040
Forwarding           http://6cc09528.ngrok.io -> https://minikube.me:443
Forwarding           https://6cc09528.ngrok.io -> https://minikube.me:443

Connections         ttl    opn    rt1    rt5    p50    p90
                   0      0      0.00   0.00   0.00   0.00
```



```
3. bash
HTTP Requests
-----
GET /.well-known/acme-challenge/FtYgFcTeAekq1NGt06 200 OK
```

```
3. bash
$ kubectl get cert -w
NAME                                READY    SECRET                                AGE
tls-ngrok-letsencrypt-certificate  False   tls-ngrok-letsencrypt-certificate    1s
tls-ngrok-letsencrypt-certificate  True    tls-ngrok-letsencrypt-certificate    44s
```

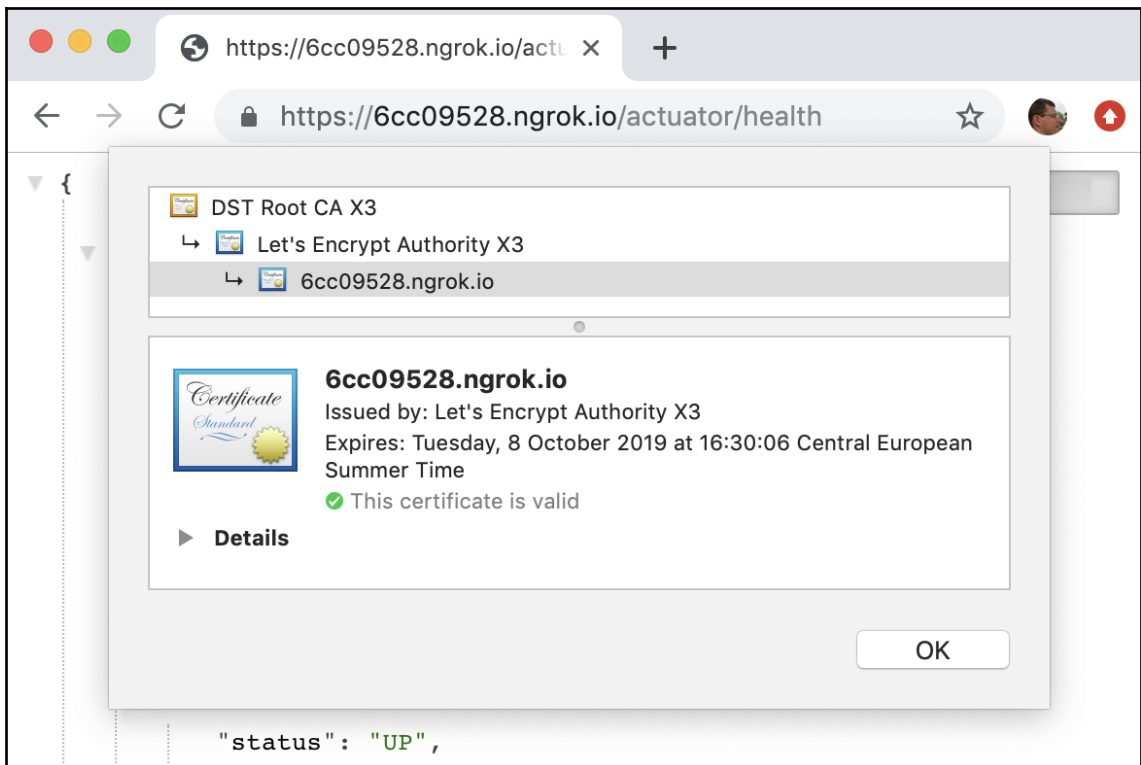


```
3. bash
$ cat /etc/hosts
...
192.168.99.121 minikube.me 6cc09528.ngrok.io
$
```

```
3. bash
$ keytool -printcert -sslserver $NGROK_HOST:443 | grep -E "Owner:|Issuer:"
Owner: CN=6cc09528.ngrok.io
Issuer: CN=Fake LE Intermediate X1
Owner: CN=Fake LE Intermediate X1
Issuer: CN=Fake LE Root X1
$
```

```
3. bash
End, all tests OK: Wed Jul 10 13:06:33 CEST 2019
$
```

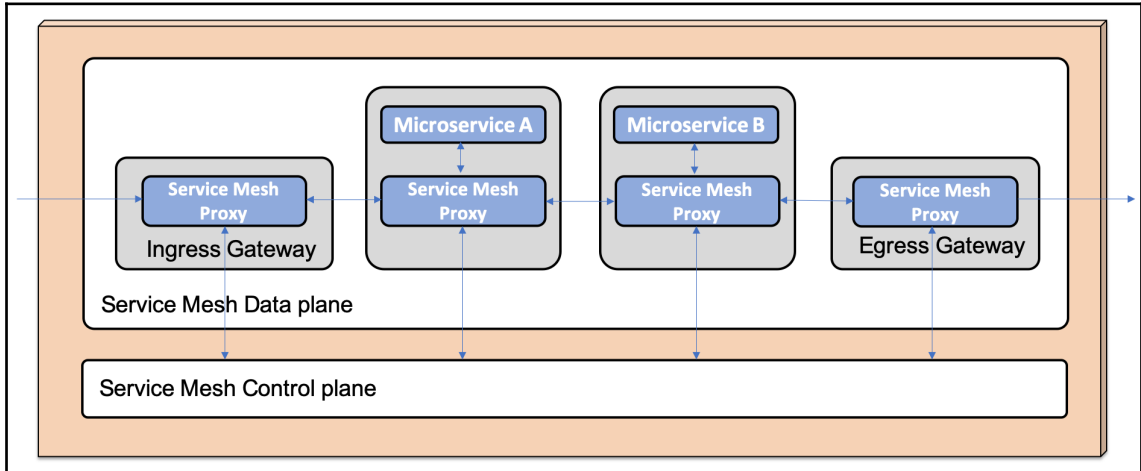
```
3. bash
$ keytool -printcert -sslserver $NGROK_HOST:443 | grep -E "Owner:|Issuer:"
Owner: CN=6cc09528.ngrok.io
Issuer: CN=Let's Encrypt Authority X3, O=Let's Encrypt, C=US
Owner: CN=Let's Encrypt Authority X3, O=Let's Encrypt, C=US
Issuer: CN=DST Root CA X3, O=Digital Signature Trust Co.
$
```

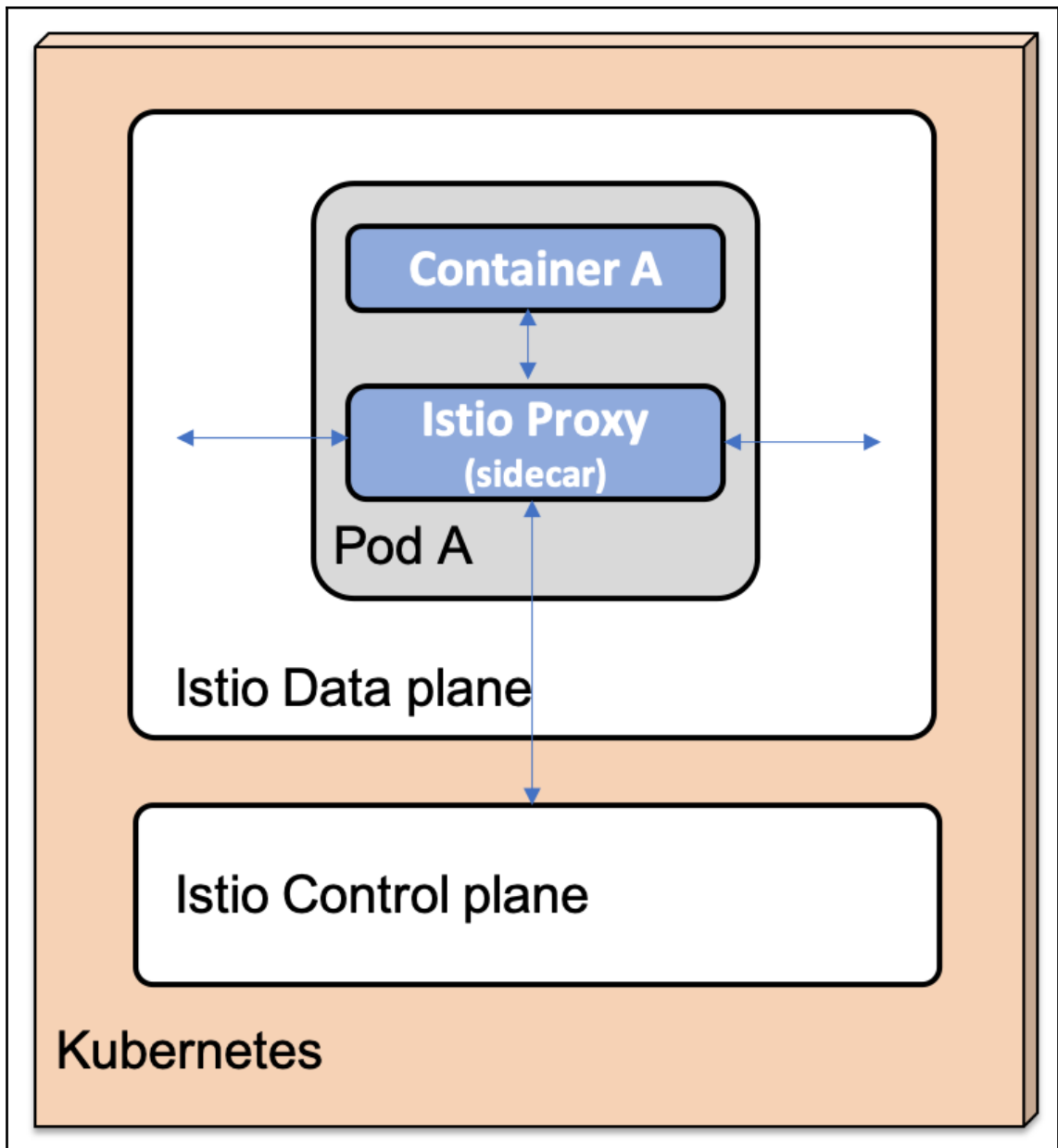


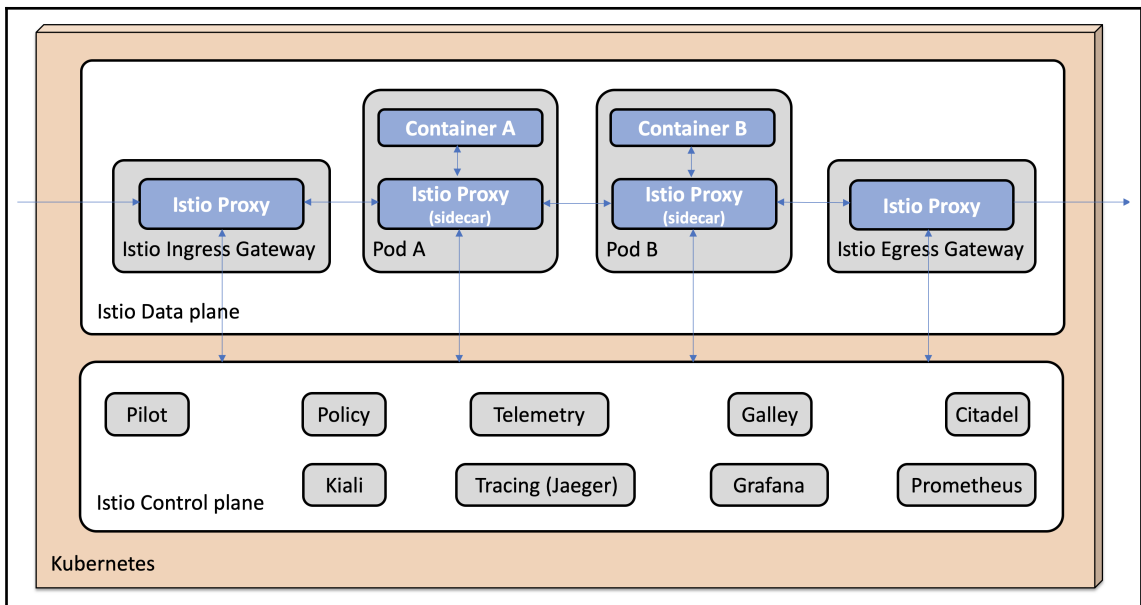
```
3. bash
End, all tests OK: Wed Jul 10 13:06:33 CEST 2019
$ █
```

```
3. bash
$ COMPOSE_FILE=docker-compose.yml ./test-em-all.bash start stop
Start Tests: Sat Jul 13 16:40:19 CEST 2019
HOST=localhost
PORT=8443
Restarting the test environment...
$ docker-compose down --remove-orphans
$ docker-compose up -d
Creating network "my-network" with the default driver
Creating book-source-code_mongodb_1 ... done
...
Creating book-source-code_product-composite_1 ... done
Wait for: curl -k https://localhost:8443/actuator/health... , retry #1 ... DONE, continues...
Test OK (HTTP Code: 200)
...
End, all tests OK: Sat Jul 13 16:42:05 CEST 2019
Stopping the test environment...
$ docker-compose down --remove-orphans
Stopping book-source-code_product-composite_1 ... done
...
Removing book-source-code_mongodb_1 ... done
Removing network my-network
$ █
```

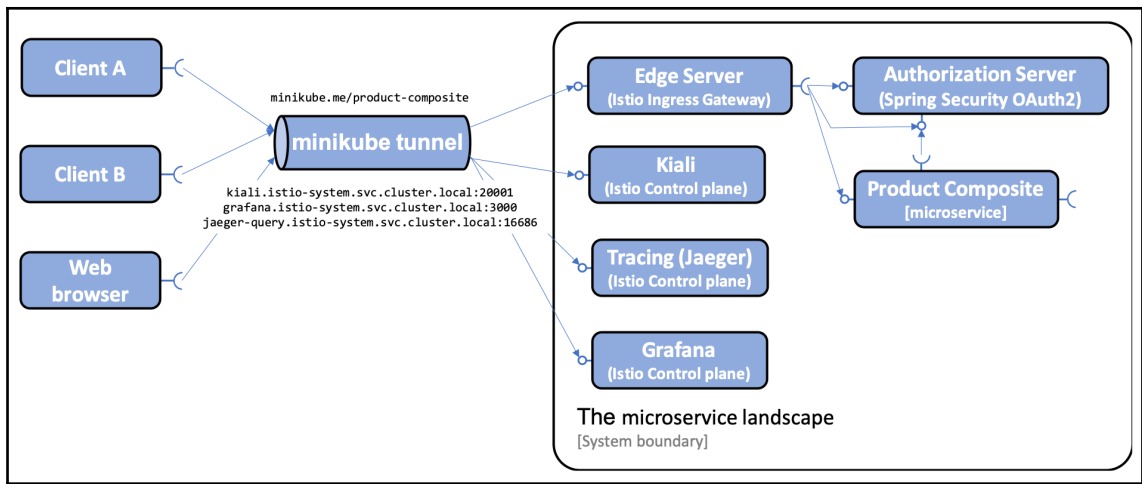
Chapter 18: Using a Service Mesh to Improve Observability and Management



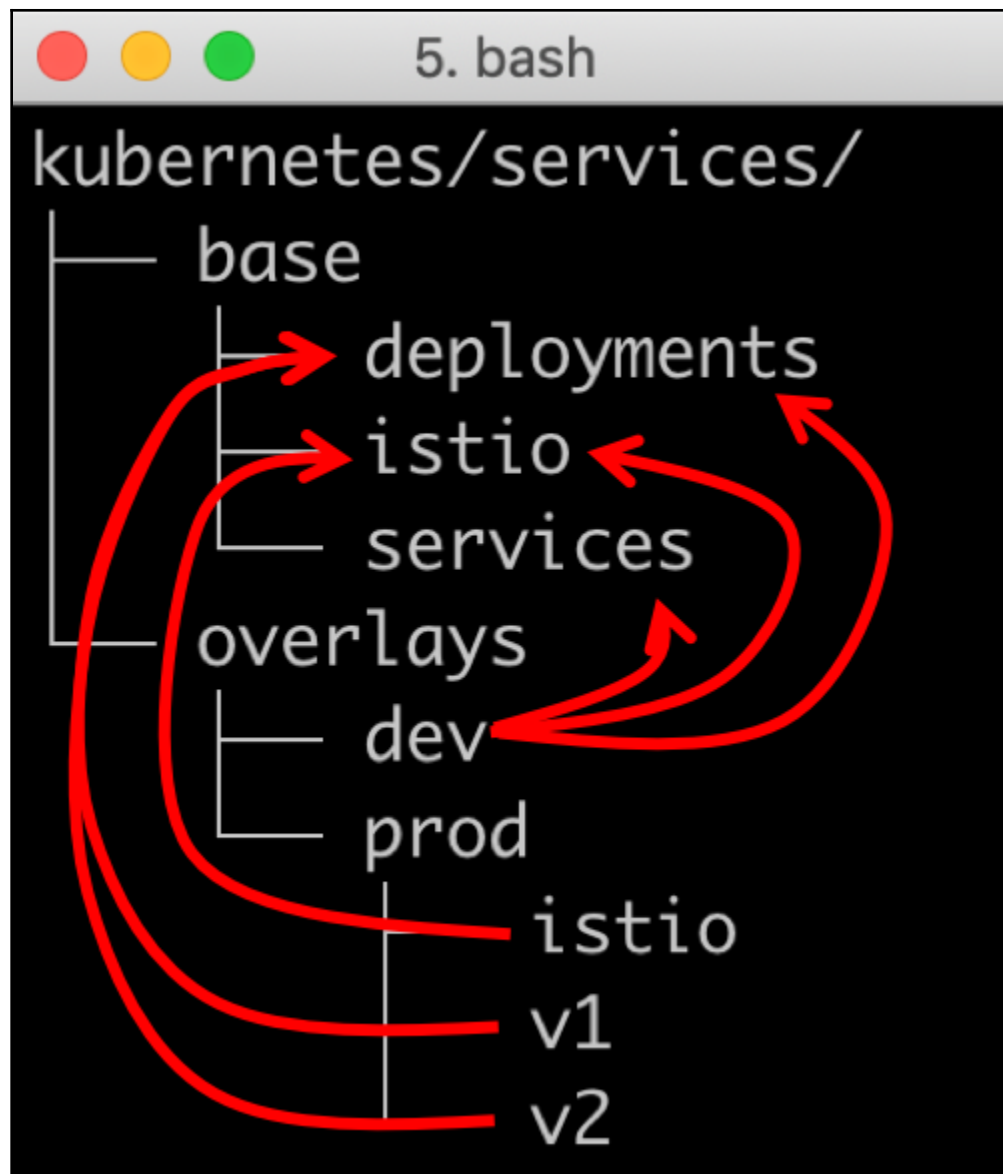




```
4. bash
$ minikube status
host: Running
kubelet: Running
apiserver: Running
kubectl: Correctly Configured: pointing to minikube-vm at 192.168.99.125
$
```



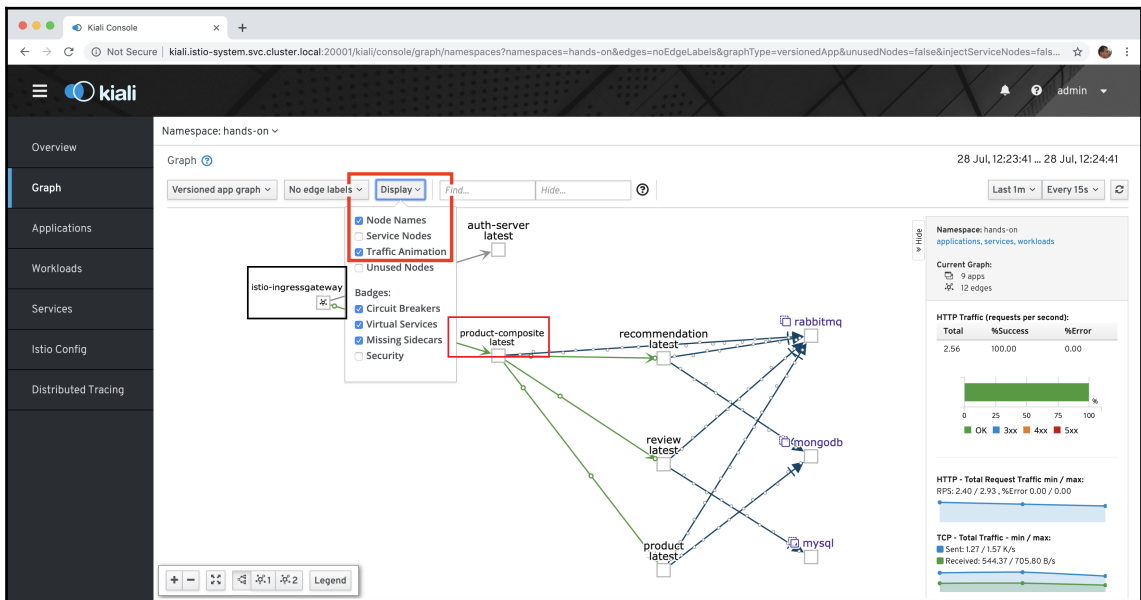
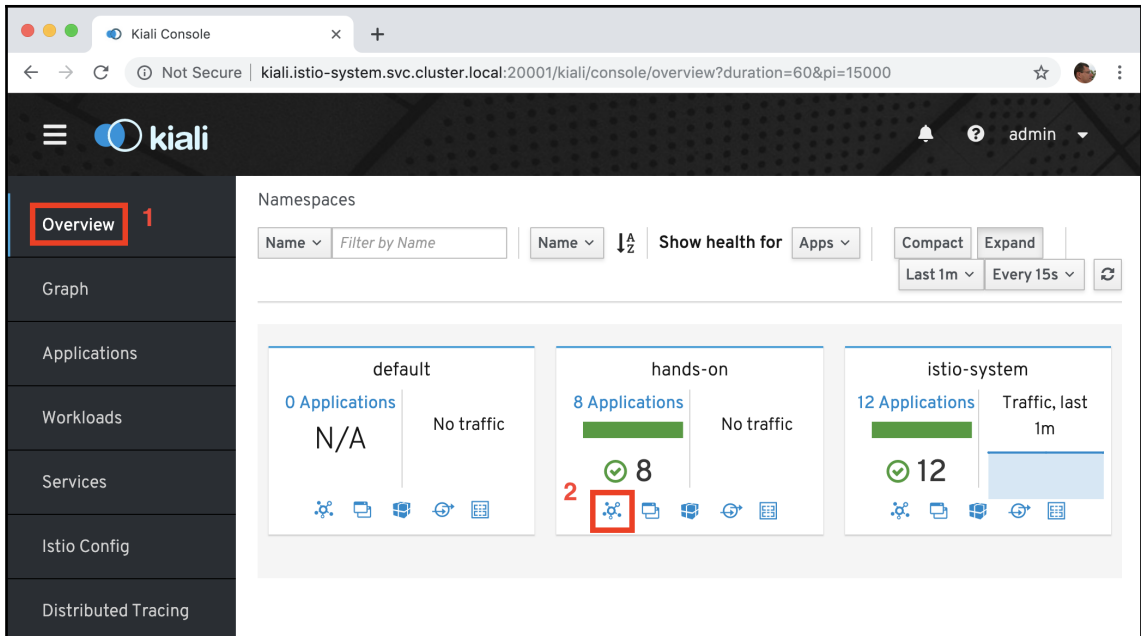
```
6. bash
$ cat /etc/hosts
...
10.102.72.36 minikube.me
$
```

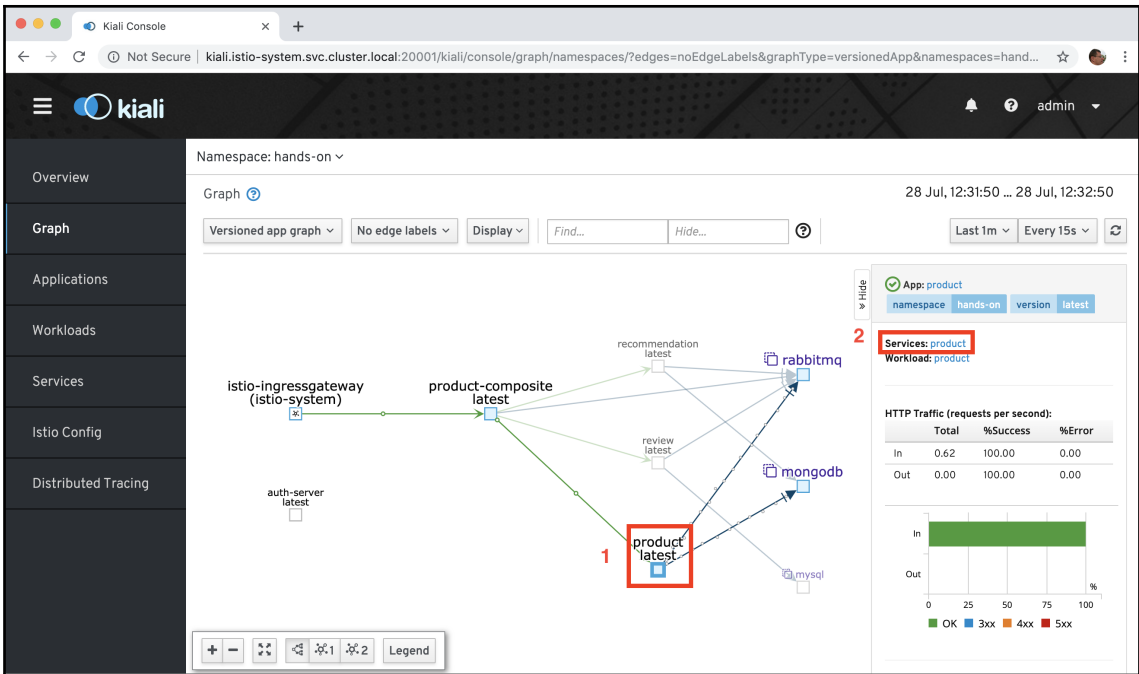


```
4. bash
$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
auth-server-78c9b85c9b-9sjs4       2/2     Running   0           8m4s
mongodb-75d7df8bd7-7s9f6           1/1     Running   0           9m33s
mysql-754d8f7584-26lxd              1/1     Running   0           9m33s
product-8695c57758-64q7x           2/2     Running   0           8m4s
product-composite-74f4dc9b4f-vkvbd  2/2     Running   0           8m4s
rabbitmq-855fb78bcc-5mcq7           1/1     Running   0           9m33s
recommendation-7bc5446b4c-btpqx     2/2     Running   0           8m4s
review-546bb44f8d-hpll7            2/2     Running   0           8m4s$
$
```

```
4. bash
$ ./test-em-all.bash
...
Wait for: curl -k http://product-composite.hands-on.svc.cluster.local:4004/actuator/health...
DONE, continues...
Test OK (HTTP Code: 200)
...
End, all tests OK: Sun Jul 28 11:47:44 CEST 2019
$
```

```
4. bash
$ siege https://minikube.me/product-composite/2 -H "Authorization: Bearer $ACCESS_TOKEN" -c1 -d1
...
The server is now under siege...
HTTP/1.1 200    0.08 secs:    772 bytes ==> GET  /product-composite/2
HTTP/1.1 200    0.03 secs:    772 bytes ==> GET  /product-composite/2
HTTP/1.1 200    0.05 secs:    772 bytes ==> GET  /product-composite/2
```





Kiali Console

← → ↻ ⓘ Not Secure | kiali.istio-system.svc.cluster.local:20001/kiali/console/namespaces/hands-on/services/product?tab=traces&start=1564307327993000&end=156... ☆ ⋮

≡

kiali

Overview

Graph

Applications

Workloads

Services

Istio Config

Distributed Tracing

admin

⌵

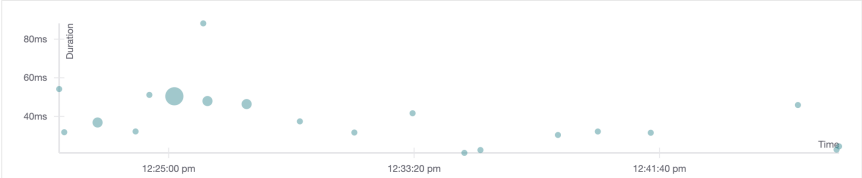
Services > Namespace: hands-on > Service: product > Service Traces

Info Traffic Inbound Metrics **Traces**

Lookback * Last 1h

🔍 Search Traces

> Show Advanced Options



20 Traces

Sort: Most Recent ⌵

istio-ingressgateway: product-composite.hands-on.svc.cluster.local:80/product-composite* 308e26e 24.51ms

8 Spans

istio-ingressgateway (1)

product-composite.hands-on (4)

product.hands-on (1)

recommendation.hands-on (1)

review.hands-on (1)

 Today 12:47:45 pm a minute ago

istio-ingressgateway: product-composite.hands-on.svc.cluster.local:80/product-composite* fb5f1ff 22.82ms

8 Spans

istio-ingressgateway (1)

product-composite.hands-on (4)

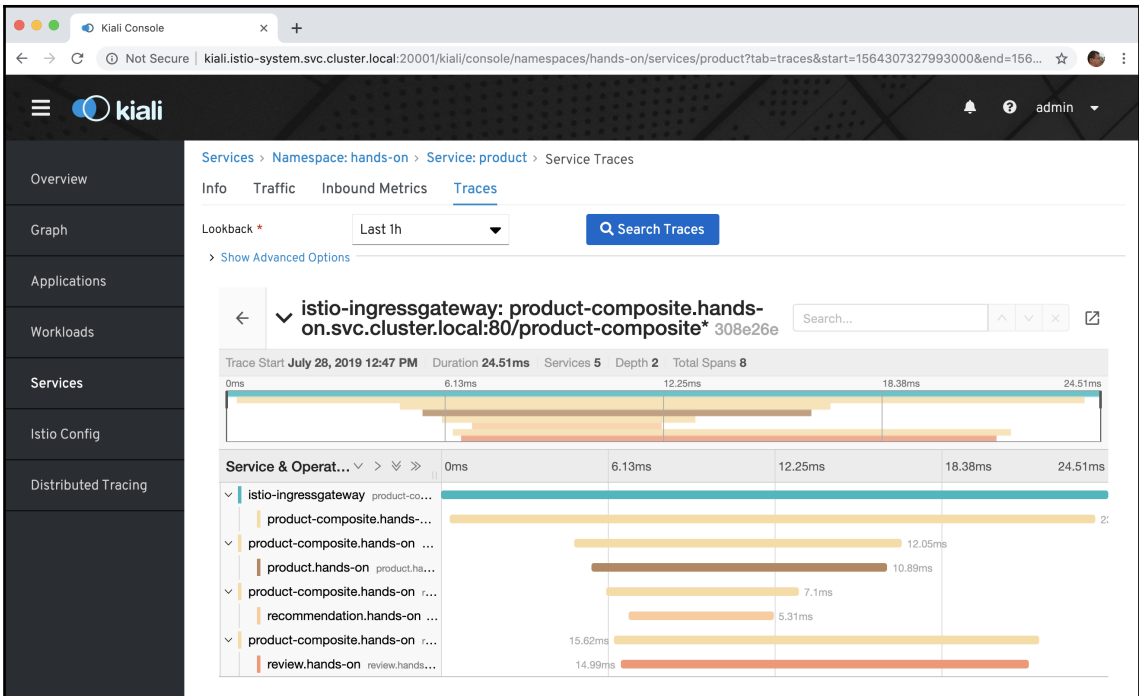
product.hands-on (1)

recommendation.hands-on (1)

review.hands-on (1)

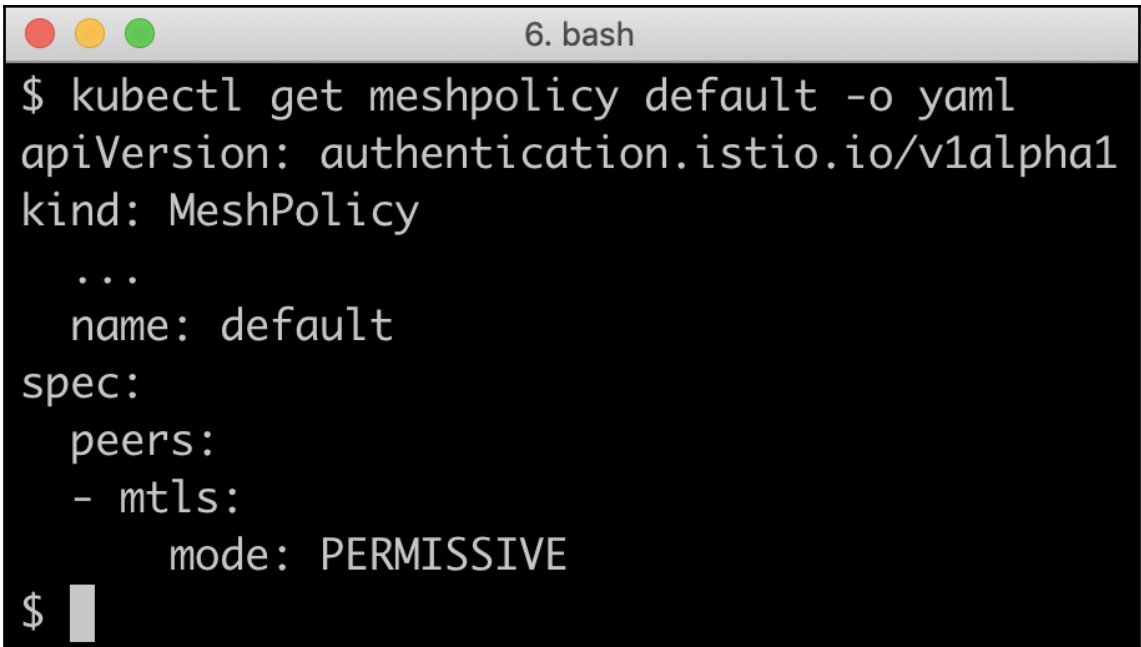
 Today 12:47:40 pm a minute ago

kiali.istio-system.svc.cluster.local:20001/kiali/#

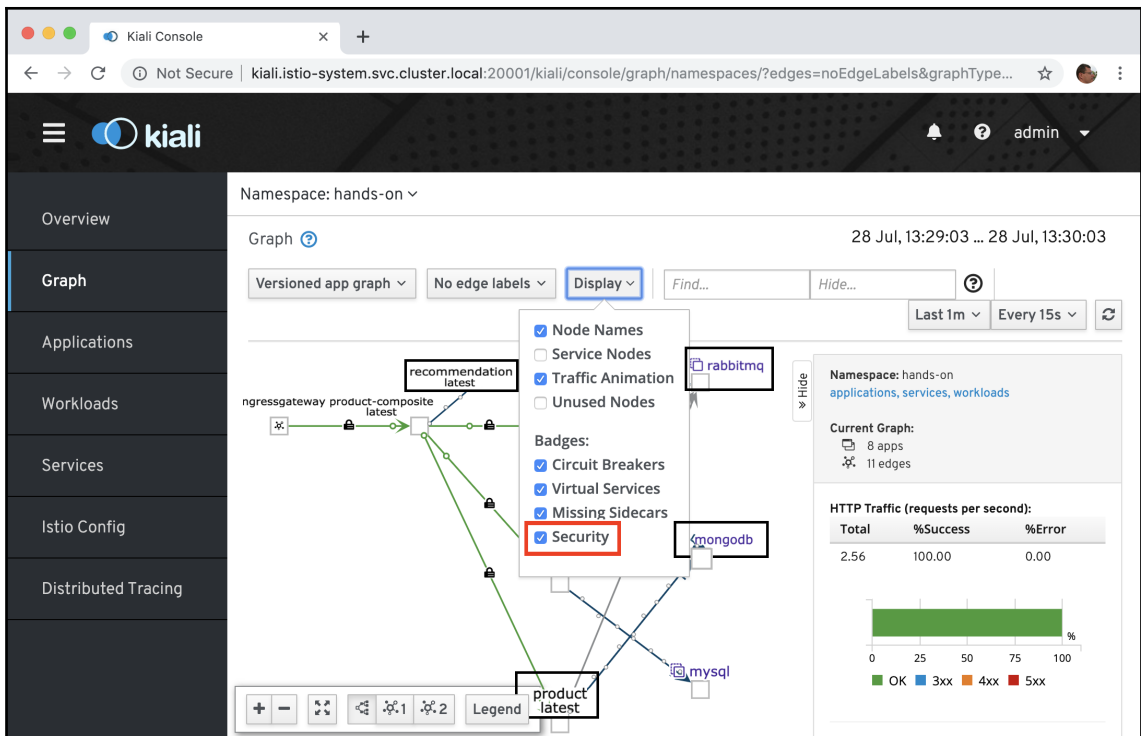


```
6. bash
...
volumeMounts:
- mountPath: /etc/istio/ingressgateway-certs
  name: ingressgateway-certs
...
volumes:
- name: ingressgateway-certs
  secret:
    optional: true
    secretName: istio-ingressgateway-certs
...
```

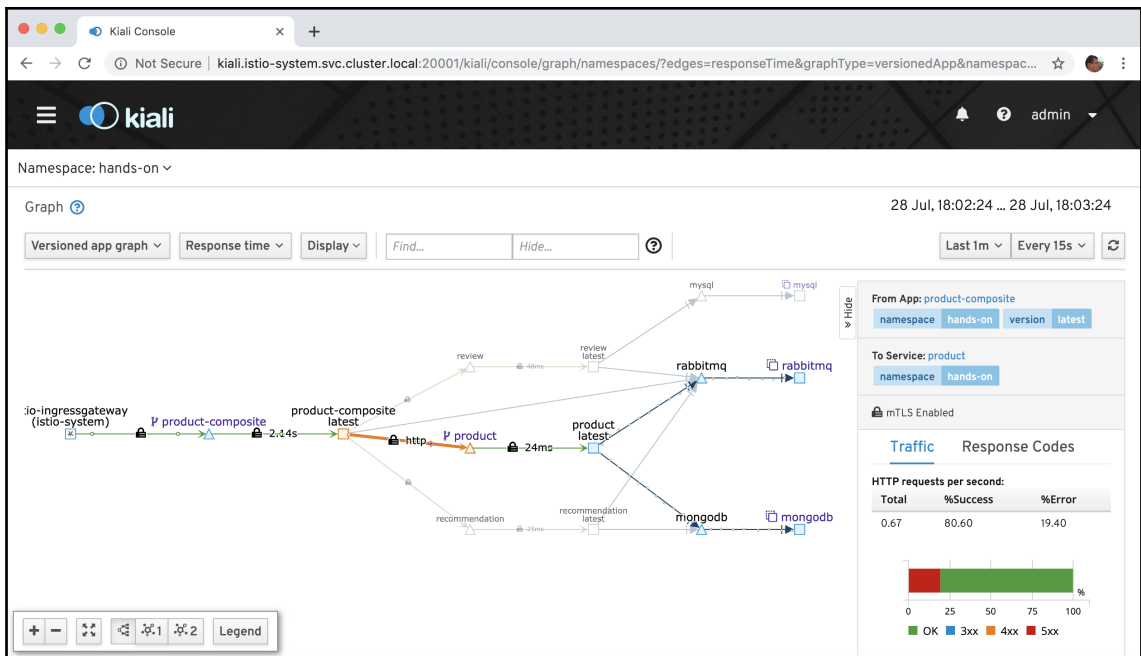
```
4. bash
$ keytool -printcert -sslserver minikube.me:443 | grep -E "Owner:|Issuer:"
Owner: O=minikube.me, CN=minikube.me
Issuer: O=minikube.me, CN=minikube.me
$
```

A terminal window with a title bar containing three colored circles (red, yellow, green) and the text "6. bash". The terminal displays the command "\$ kubectl get meshpolicy default -o yaml" and its output in YAML format. The output shows the API version, kind, name, and specification of the MeshPolicy resource.

```
$ kubectl get meshpolicy default -o yaml
apiVersion: authentication.istio.io/v1alpha1
kind: MeshPolicy
  ...
  name: default
spec:
  peers:
  - mtls:
      mode: PERMISSIVE
$
```

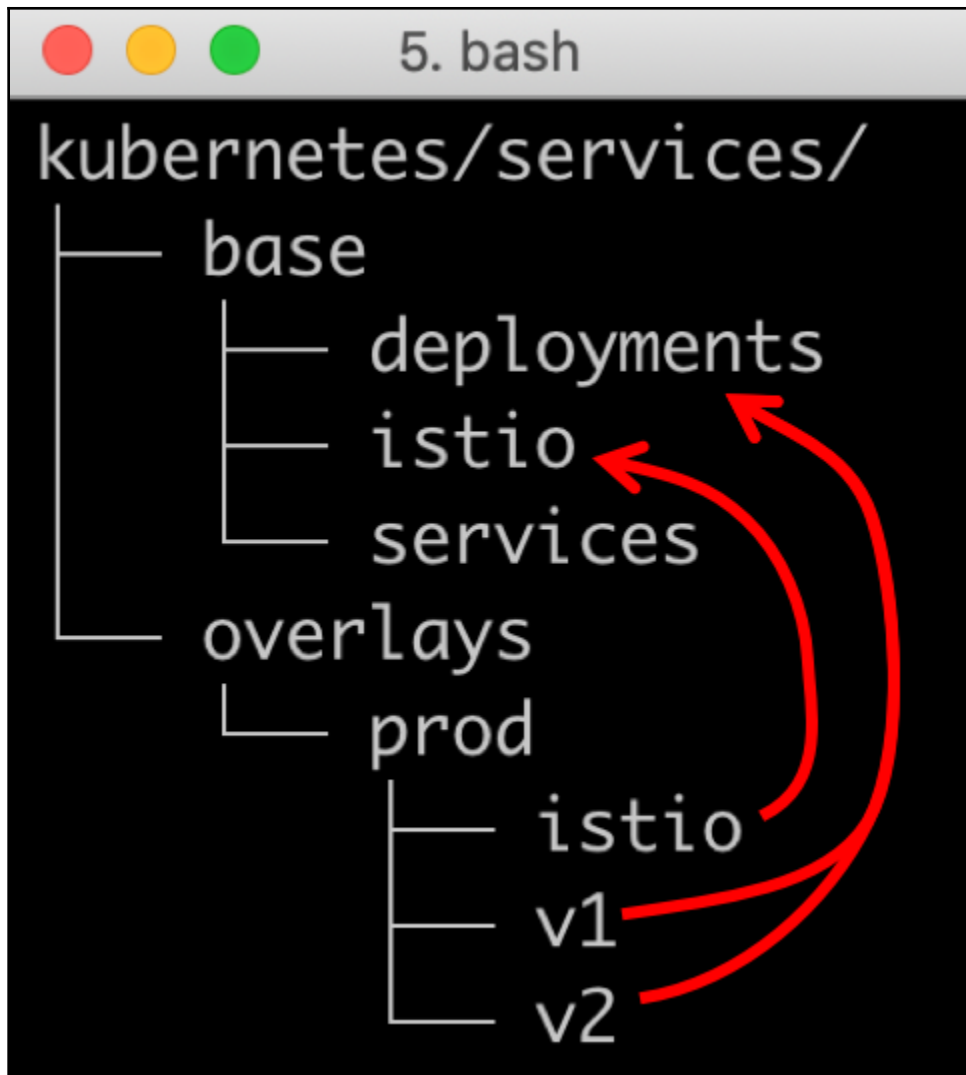


```
4. bash
HTTP/1.1 200 0.03 secs: 772 bytes ==> GET /product-composite/2
HTTP/1.1 200 1.08 secs: 772 bytes ==> GET /product-composite/2
HTTP/1.1 200 0.03 secs: 772 bytes ==> GET /product-composite/2
HTTP/1.1 200 0.05 secs: 772 bytes ==> GET /product-composite/2
HTTP/1.1 200 1.03 secs: 772 bytes ==> GET /product-composite/2
HTTP/1.1 200 0.06 secs: 772 bytes ==> GET /product-composite/2
```



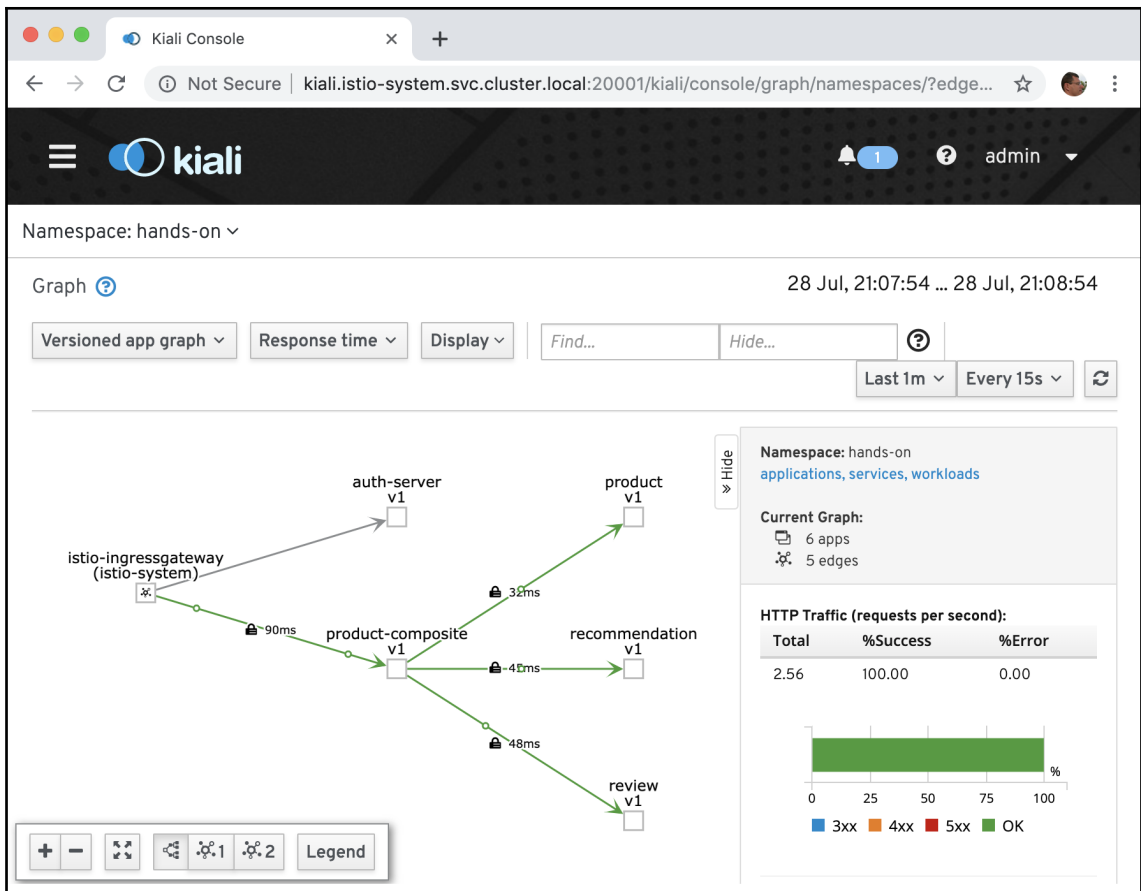
6. bash

```
{"productId":2,"name":"Fallback product2"...  
real    0m0.083s
```



```
4. bash
$ ./kubernetes/scripts/deploy-prod-env.bash
...
+ kubectl wait --timeout=120s --for=condition=Ready pod --all
pod/auth-server-v1-5f75968f7f-v7j8p condition met
pod/auth-server-v2-97b4b5cb4-lcvx4 condition met
pod/product-composite-v1-7f87fd87cb-2vmjl condition met
pod/product-composite-v2-99855f749-lz44j condition met
pod/product-v1-b8d48477c-qvl9f condition met
pod/product-v2-657cd6749d-xdh9c condition met
pod/recommendation-v1-545fb976cd-jfq9w condition met
pod/recommendation-v2-66d475fbf7-swdhs condition met
pod/review-v1-868c87cc95-ww2hv condition met
pod/review-v2-f4c97c748-2mlwm condition met
$
```

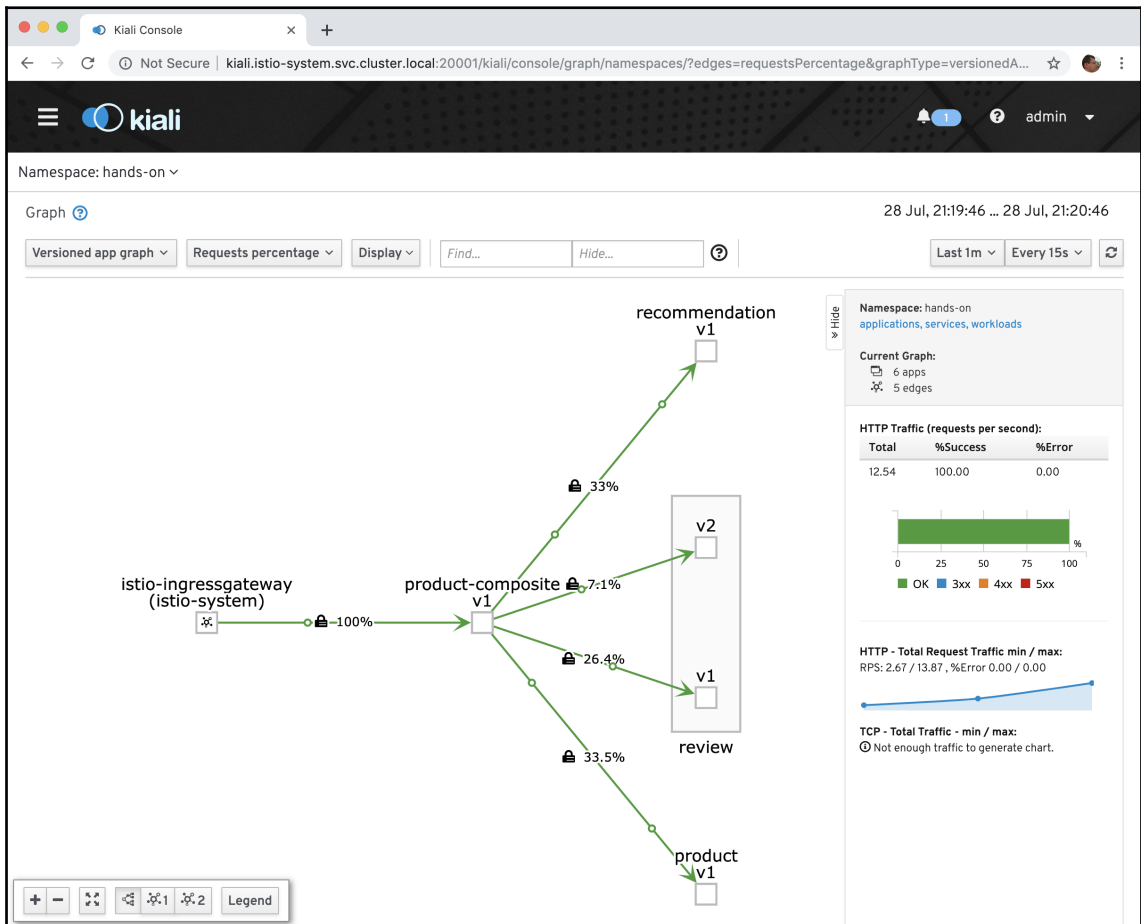
```
4. bash
$ SKIP_CB_TESTS=true ./test-em-all.bash
...
Wait for: curl -k http://product-composite.hands-on.svc.cluster.local:4004/actuator/health...
DONE, continues...
Test OK (HTTP Code: 200)
...
End, all tests OK: Mon Aug 5 09:19:37 CEST 2019
$
```

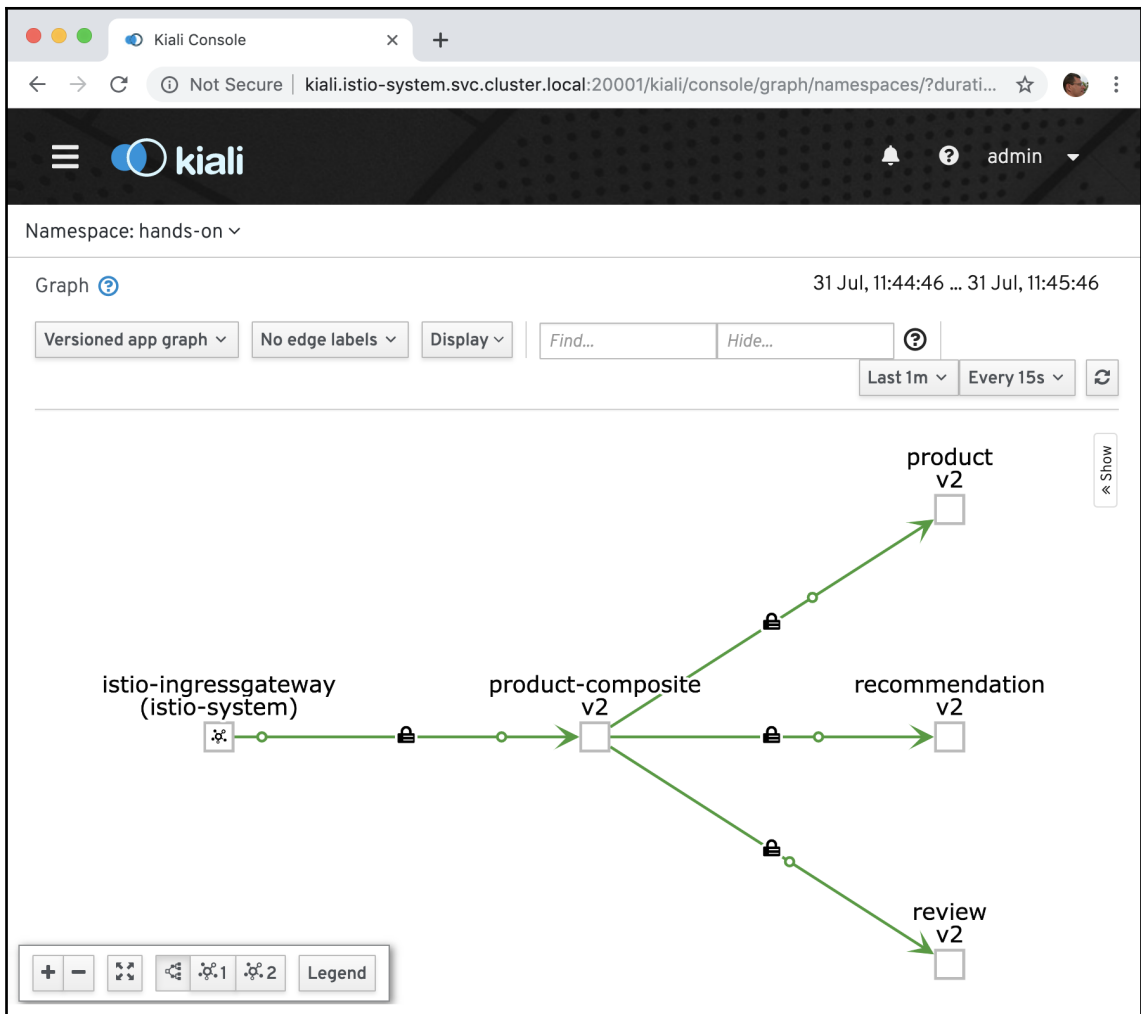


```
4, bash
$ curl -ks https://minikube.me/product-composite/2 -H "Authorization: Bearer $ACCESS_TOKEN" | jq .serviceAddresses
{
  "cmp": "product-composite-v1-7f87fd87cb-2vmjl/172.17.0.25:80",
  "pro": "product-v1-b8d48477c-qvl9f/172.17.0.27:80",
  "rev": "review-v1-868c87cc95-ww2hv/172.17.0.29:80",
  "rec": "recommendation-v1-545fb976cd-jfq9w/172.17.0.28:80"
}
```

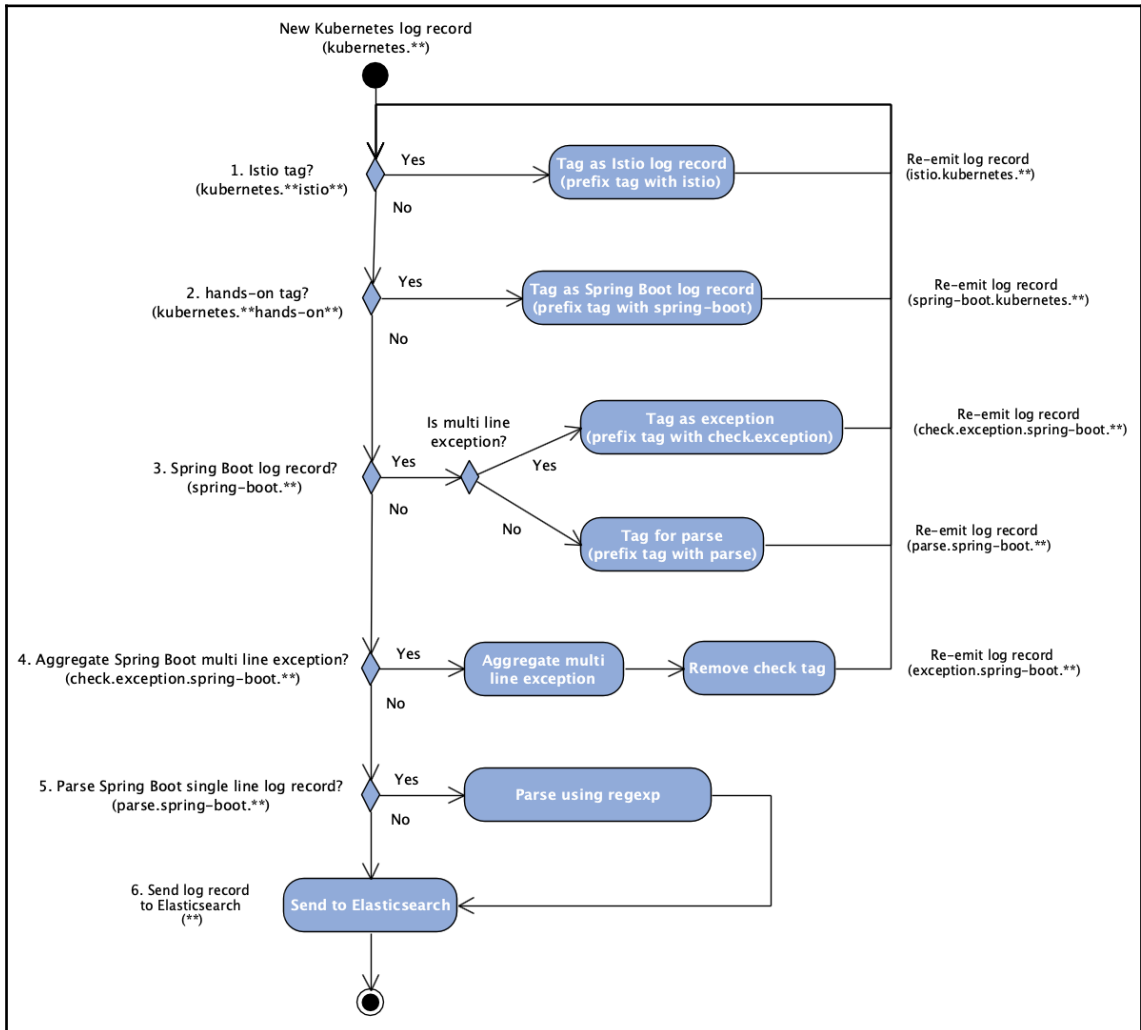


```
4. bash
$ curl -ks https://minikube.me/product-composite/2 \
-H "Authorization: Bearer $ACCESS_TOKEN" -H "X-group: test" | jq .serviceAddresses
{
  "cmp": "product-composite-v1-7f87fd87cb-2vmjl/172.17.0.25:80",
  "pro": "product-v2-657cd6749d-xdh9c/172.17.0.32:80",
  "rev": "review-v2-f4c97c748-2mlwm/172.17.0.33:80",
  "rec": "recommendation-v2-66d475fbf7-swdhs/172.17.0.34:80"
}
```



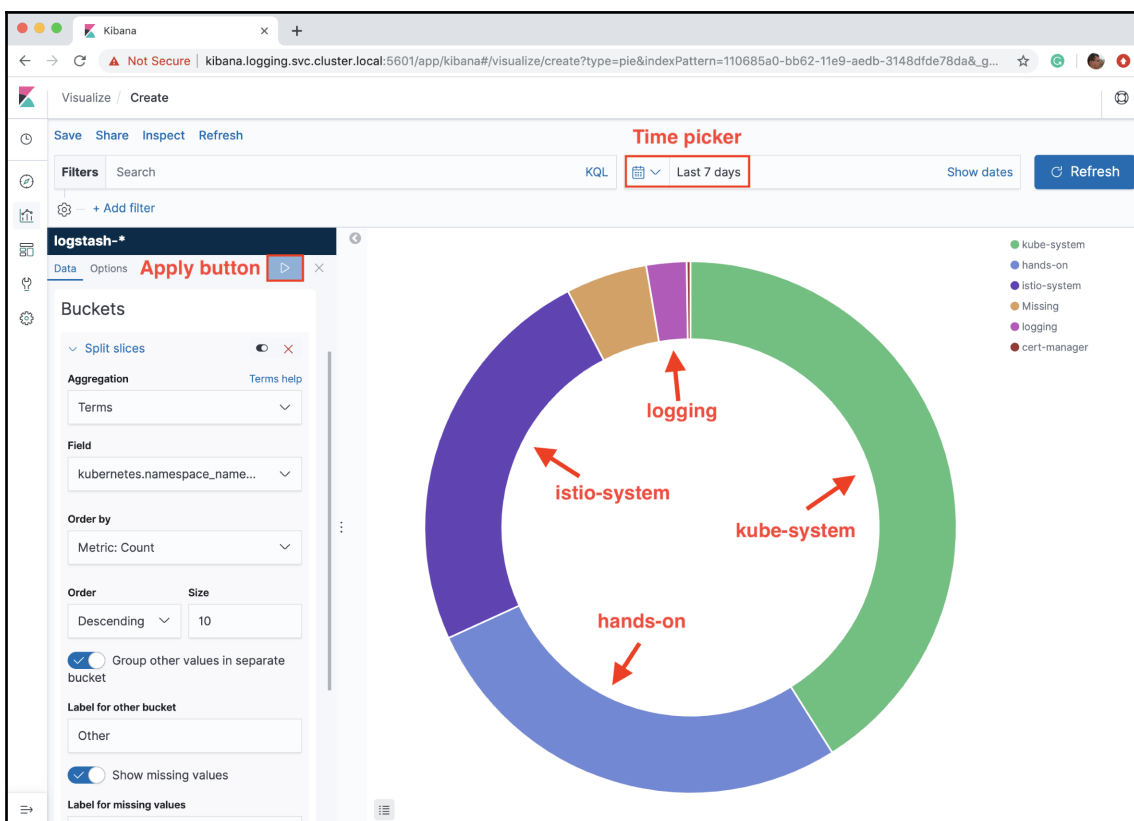


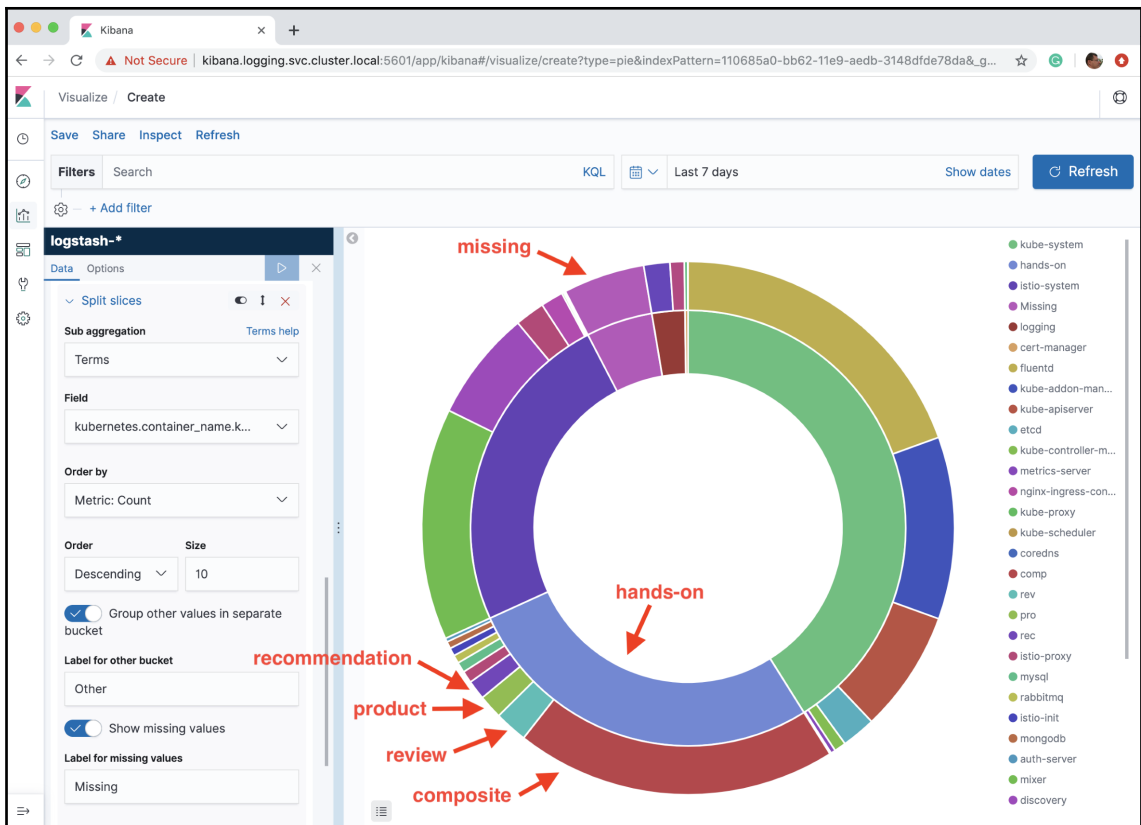
Chapter 19: Centralized Logging with the EFK Stack



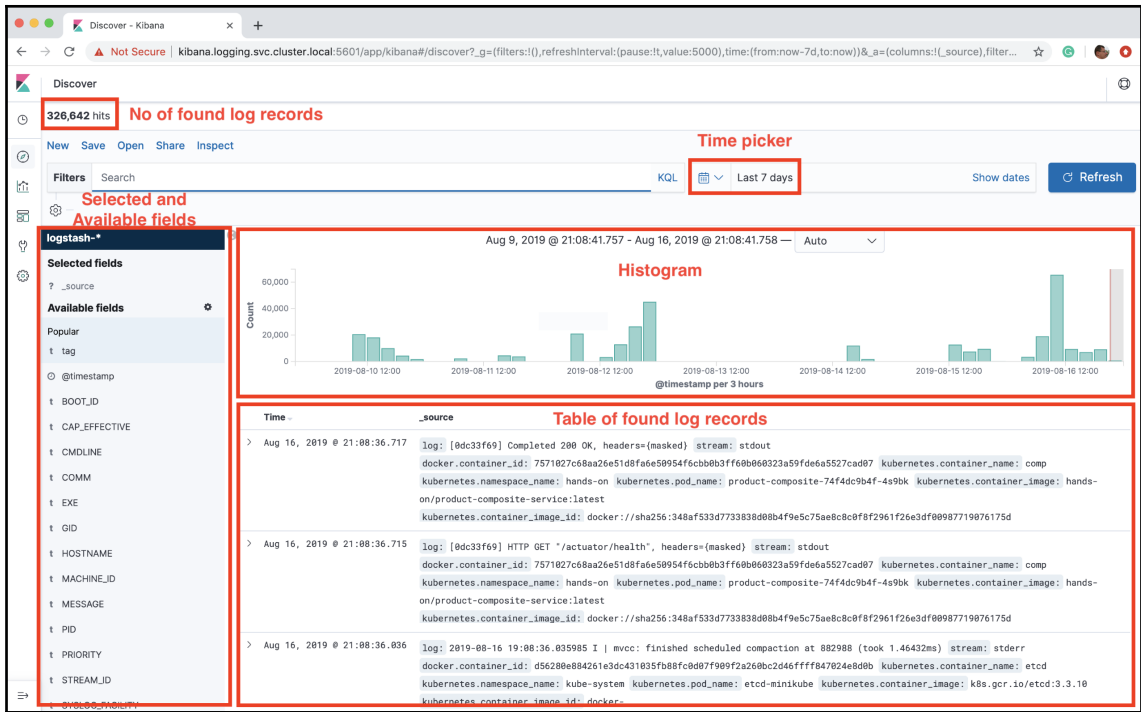
```
4. bash
$ ./test-em-all.bash
...
Wait for: curl -k http://product-composite.hands-on.svc.cluster.local:4004/actuator/health...
DONE, continues...
Test OK (HTTP Code: 200)
...
End, all tests OK: Sun Jul 28 11:47:44 CEST 2019
$
```

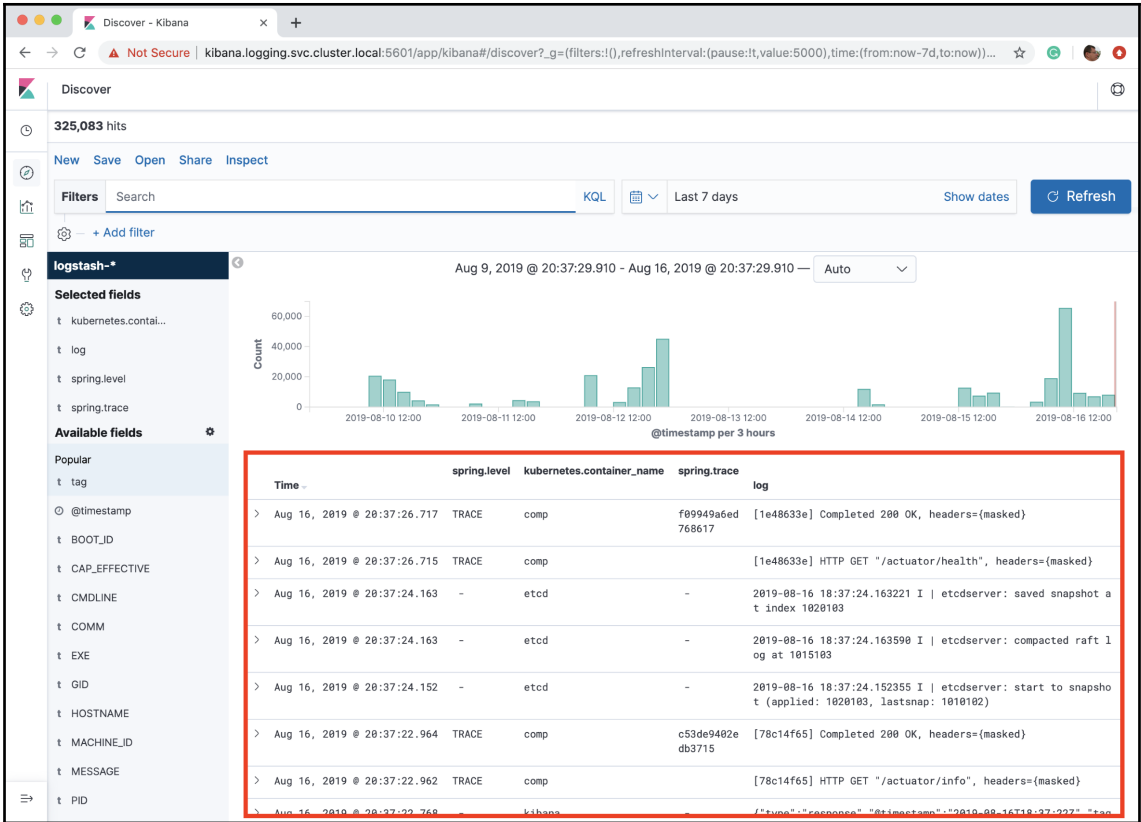
```
4. bash
$ curl http://elasticsearch.logging.svc.cluster.local:9200/_all/_count
{"count":144750,"_shards":{"total":7,"successful":7,"skipped":0,"failed":0}}
$
```





```
4. bash
$ curl -H "Authorization: Bearer $ACCESS_TOKEN" -k 'https://minikube.me/product-composite/1234'
{"productId":1234,"name":"product name 1234","weight":1234,"recommendations":[],"reviews":[],
"serviceAddresses":{"cmp":"product-composite-74f4dc9b4f-4s9bk/172.17.0.39:80","pro":"product-869
5c57758-ttmsg/172.17.0.40:80","rev":"","rec":""}}
$
```





Discover - Kibana

12 hits

Filters 1 Search

spring.trace: d31015ff2d5771896e3e8cf0f9bbb404 x + Add filter

logstash-*

Selected fields

- t_kubernetes.container_name
- t_log
- t_spring.level
- t_spring.trace

Available fields

Popular

- @timestamp
- BOOT_ID
- CAP_EFFECTIVE
- CMDLINE
- COMM

Time -

Count

Aug 9, 2019 @ 21:27:11.585 - Aug 16, 2019 @ 21:27:11.585

@timestamp per 3 hours

Time -	spring.level	kubernetes.container_name	spring.trace	log
> Aug 16, 2019 @ 21:00:49.878	TRACE	comp	d31015ff2d5771896e3e8cf0f9bbb404	[175ed9eb] Completed 200 OK, headers=(masked)
> Aug 16, 2019 @ 21:00:49.867	DEBUG	comp	d31015ff2d5771896e3e8cf0f9bbb404	Authorization info: Subject: magnus, scopes: ["product:read","product:write"], expires Thu Aug 19 01:53:43 GMT 2038: Issuer: http://auth-server.local, audience: null
> Aug 16, 2019 @ 21:00:49.859	DEBUG	rev	d31015ff2d5771896e3e8cf0f9bbb404	Response size: 0
> Aug 16, 2019 @ 21:00:49.852	TRACE	rev	d31015ff2d5771896e3e8cf0f9bbb404	binding parameter [1] as [INTEGER] - [1234]

Discover - Kibana

4 hits

Filters 3 Search

spring.trace: d31015ff2d5771896e3e8cf0f9bbb404 x NOT spring.level: TRACE x NOT spring.level: DEBUG x + Add filter

logstash-*

Selected fields

- t_kubernetes.container_name
- t_log
- t_spring.level
- t_spring.trace

Available fields

Popular

- @timestamp
- BOOT_ID
- CAP_EFFECTIVE
- CMDLINE

Time -

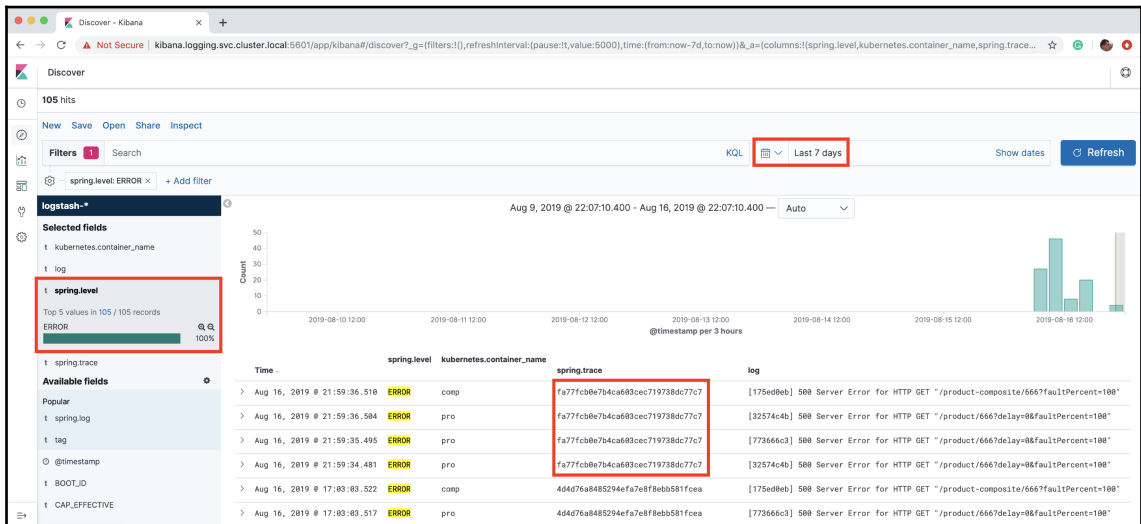
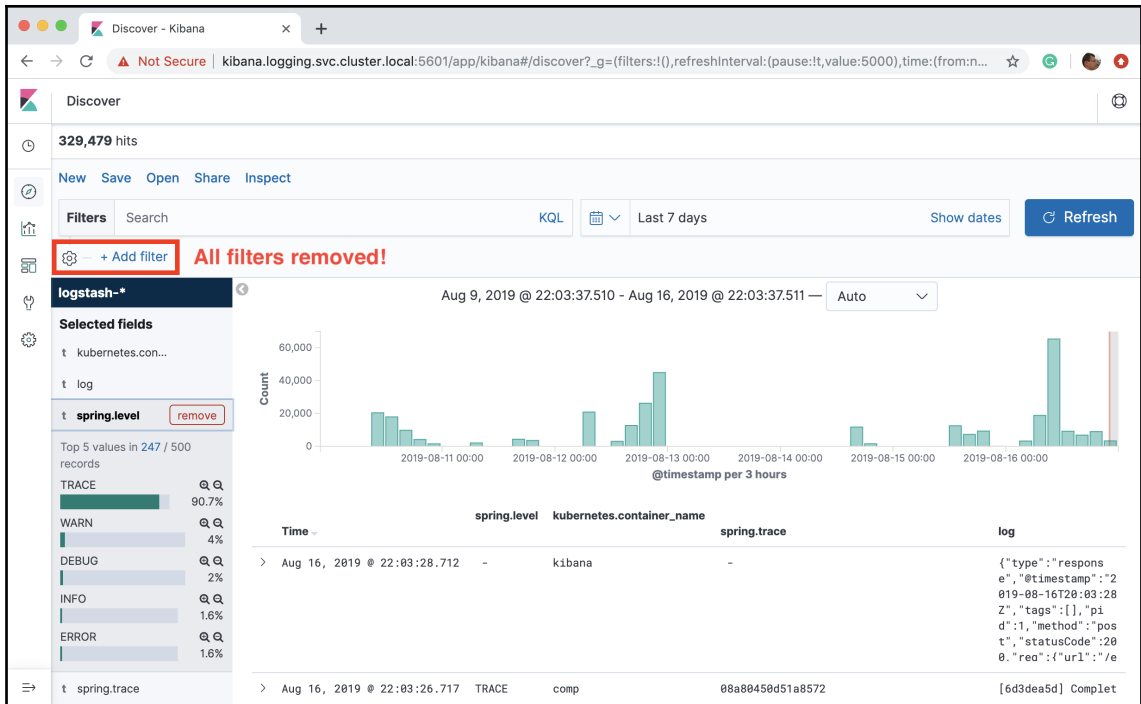
Count

Aug 9, 2019 @ 21:42:42.530 - Aug 16, 2019 @ 21:42:42.530

@timestamp per 3 hours

Time -	spring.level	kubernetes.container_name	spring.trace	log
> Aug 16, 2019 @ 21:00:49.845	INFO	pro	d31015ff2d5771896e3e8cf0f9bbb404	Will get product info for id=1234
> Aug 16, 2019 @ 21:00:49.843	INFO	rev	d31015ff2d5771896e3e8cf0f9bbb404	Will get reviews for product with id=1234
> Aug 16, 2019 @ 21:00:49.841	INFO	rec	d31015ff2d5771896e3e8cf0f9bbb404	Will get recommendations for product with id=1234
> Aug 16, 2019 @ 21:00:49.831	INFO	comp	d31015ff2d5771896e3e8cf0f9bbb404	Will get composite product info for product.id=1234

```
4. bash
$ curl -H "Authorization: Bearer $ACCESS_TOKEN" -k https://minikube.me/product-composite/666?faultPercent=100
{"timestamp":"2019-08-16T19:59:36.509+0000","path":"/product-composite/666","status":500,"error":"Internal Server Error","message":"500 Internal Server Error"}
$
```

Discover - Kibana

Discover

DEBUG 20%
INFO 16%
ERROR 16%
TRACE 8%

Available fields

Popular

Time
spring.level
kubernetes.container_name
spring.trace
log

Time	spring.level	kubernetes.container_name	spring.trace	log
> Aug 16, 2019 @ 21:59:36.511	TRACE	comp	fa77fcb0e7b4ca803cec719738dc77c7	[175ed8eb] Completed 500 INTERNAL_SERVER_ERROR, headers={masked}
> Aug 16, 2019 @ 21:59:36.518	ERROR	comp	fa77fcb0e7b4ca803cec719738dc77c7	[175ed8eb] 500 Server Error for HTTP GET "/product-composite/666?faultPercent=100"
> Aug 16, 2019 @ 21:59:36.588	WARN	comp	fa77fcb0e7b4ca803cec719738dc77c7	getCompositeProduct failed: org.springframework.web.reactive.function.client.WebClientResponseExceptionInternalServerError: 500 Internal Server Error
> Aug 16, 2019 @ 21:59:36.587	WARN	comp	fa77fcb0e7b4ca803cec719738dc77c7	Got a unexpected HTTP error: 500 INTERNAL_SERVER_ERROR, will rethrow it
> Aug 16, 2019 @ 21:59:36.587	WARN	comp	fa77fcb0e7b4ca803cec719738dc77c7	Error body: {"timestamp":"2019-08-16T19:59:36.583+0000","path":"/product/666","status":500,"error":{"Internal Server Error"},"message":"Something went wrong..."}
> Aug 16, 2019 @ 21:59:36.584	ERROR	pro	fa77fcb0e7b4ca803cec719738dc77c7	[32574c4b] 500 Server Error for HTTP GET "/product/666?delay=8&faultPercent=100"
> Aug 16, 2019 @ 21:59:36.582	WARN	pro	fa77fcb0e7b4ca803cec719738dc77c7	Bad luck, an error occurred, 100 >= 53

Expanded document

Table JSON

@timestamp Aug 16, 2019 @ 21:59:36.582
_cqWdNwBo8TdMqKoTAJ
_index logstash-2019.08.16
_score -

View surrounding documents View single document

Kibana

Discover / Context of logstash-*#cQwDnGwBo8TdMqKoTAJ

spring.trace=fa77fcb0e7b4ca803cec719738dc77c7

Load 5 more 5 newer documents

Time	spring.level	kubernetes.container_name	spring.trace	log
> Aug 16, 2019 @ 21:59:36.507	WARN	comp	fa77fcb0e7b4ca803cec719738dc77c7	Got a unexpected HTTP error: 500 INTERNAL_SERVER_ERROR, will rethrow it
> Aug 16, 2019 @ 21:59:36.505	-	pro	-	-
> Aug 16, 2019 @ 21:59:36.504	-	pro	-	java.lang.RuntimeException: Something went wrong... at se.magnus.microservices.core.product.services.ProductServiceImpl.throwErrorIfBadLuck(ProductServiceImpl.java:96) ~[classes/:na] at se.magnus.microservices.core.product.services.ProductServiceImpl.getProduct(ProductServiceImpl.java:64) ~[classes/:na] at jdk.internal.reflect.GeneratedMethodAccessor108.invoke(Unknown Source) ~[na:na] at java.base/jdk.internal.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43) ~[na:na] at java.base/java.lang.reflect.Method.invoke(Method.java:567) ~[na:na]
> Aug 16, 2019 @ 21:59:36.504	-	pro	-	-
> Aug 16, 2019 @ 21:59:36.504	ERROR	pro	fa77fcb0e7b4ca803cec719738dc77c7	[32574c4b] 500 Server Error for HTTP GET "/product/666?delay=0&faultPercent=100"
> Aug 16, 2019 @ 21:59:36.502	WARN	pro	fa77fcb0e7b4ca803cec719738dc77c7	Bad luck, an error occurred, 100 >= 53
> Aug 16, 2019 @ 21:59:35.498	WARN	comp	fa77fcb0e7b4ca803cec719738dc77c7	Error body: {"timestamp":"2019-08-16T19:59:35.493+0000","path":"/product/666","status":500,"error":{"Internal Server Error"},"message":"Something went wrong..."}

Filters 2 Search KQL Last 30 days

NOT kubernetes.namespace_name: hands-on x spring.level: ERROR x + Add filter

No results match your search criteria

Discover - Kibana

Not Secure kibana.logging.svc.cluster.local:5601/app/kibana#/discover?_g=(filters:!(),refreshInterval:(pause:!t,valu...

Discover

Table JSON

@timestamp	Aug 25, 2019 @ 21:04:09.588
t _id	XxgqymwBo8TdMbqKHGR5
t _index	logstash-2019.08.25
# _score	-
t _type	_doc
t docker.container_id	87b693a1c656bf695fe4f77c940ff91ae0c64b0f00f877a7834bf9da497e8741
t kubernetes.container_image	hands-on/product-composite-service:latest
t kubernetes.container_image_id	docker://sha256:9a05238d81dba529fb18afc6d5194256b46ed056dc3d2a8bc6ef5b1129f40cee
t kubernetes.container_name	comp
t kubernetes.host	minikube
t kubernetes.labels.app	product-composite
t kubernetes.labels.pod-template-hash	6548f697f9
t kubernetes.labels.version	latest
t kubernetes.master_url	https://10.96.0.1:443/api
t kubernetes.namespace_id	ca12e9f8-b064-4d89-b234-138a92ff93c1
t kubernetes.namespace_name	hands-on
t kubernetes.pod_id	964e8bde-831e-4fd9-99fb-86d802796299
t kubernetes.pod_name	product-composite-6548f697f9-6t5hs
t log	Will get composite product info for product.id=2
t spring.class	s.m.m.c.p.s.ProductCompositeServiceImpl
t spring.level	INFO
t spring.pid	1
t spring.service	product-composite
t spring.span	a7a9ceb9c3f3700c
t spring.thread	or-http-epoll-1
t spring.trace	b1abc90adc29a79e8f5c58c28196741c
t stream	stdout
t tag	parse.spring-boot.kubernetes.var.log.containers.product-composite-6548f697f9-6t5hs_s_hands-on_comp-87b693a1c656bf695fe4f77c940ff91ae0c64b0f00f877a7834bf9da497e8741.log

Time

log

▼

Aug 25, 2019 @ 18:35:33.255

onError(se.magnus.util.exceptions.InvalidInputException: Invalid productId: -1)

Expanded document

[View surrounding documents](#)

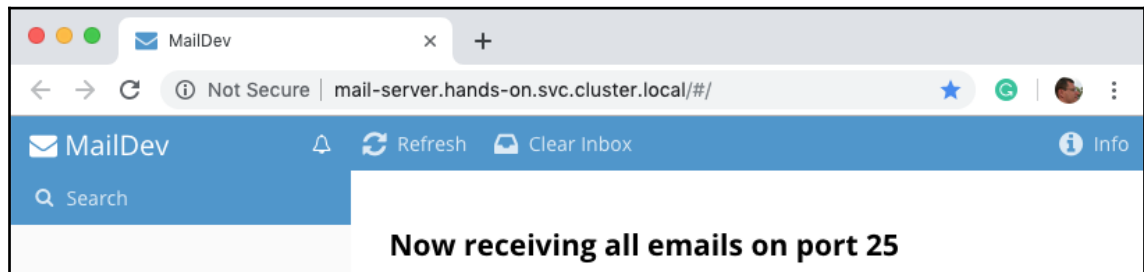
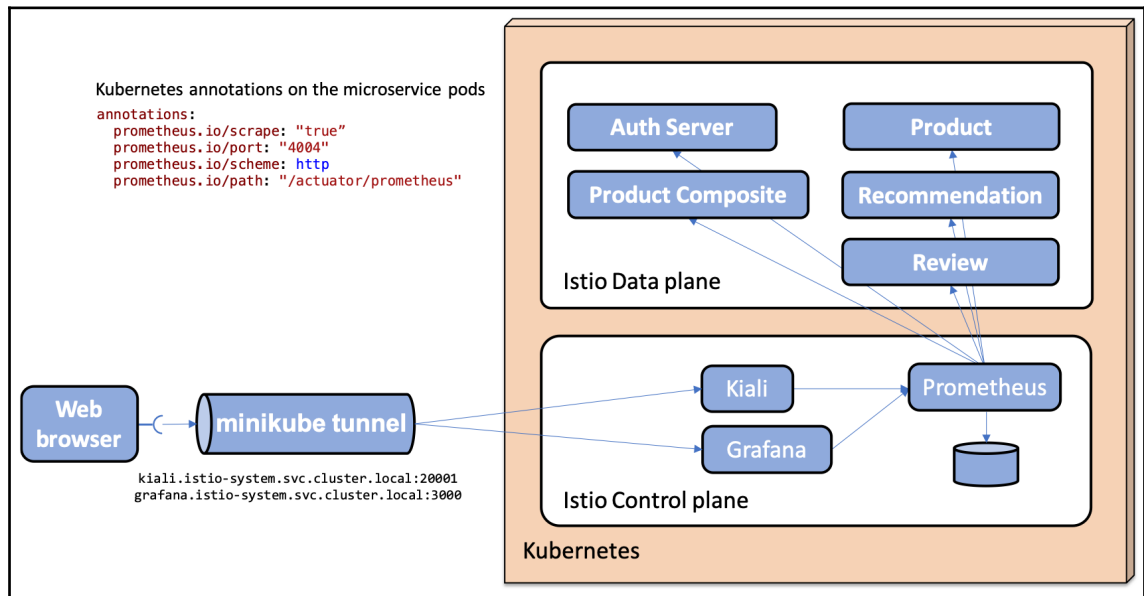
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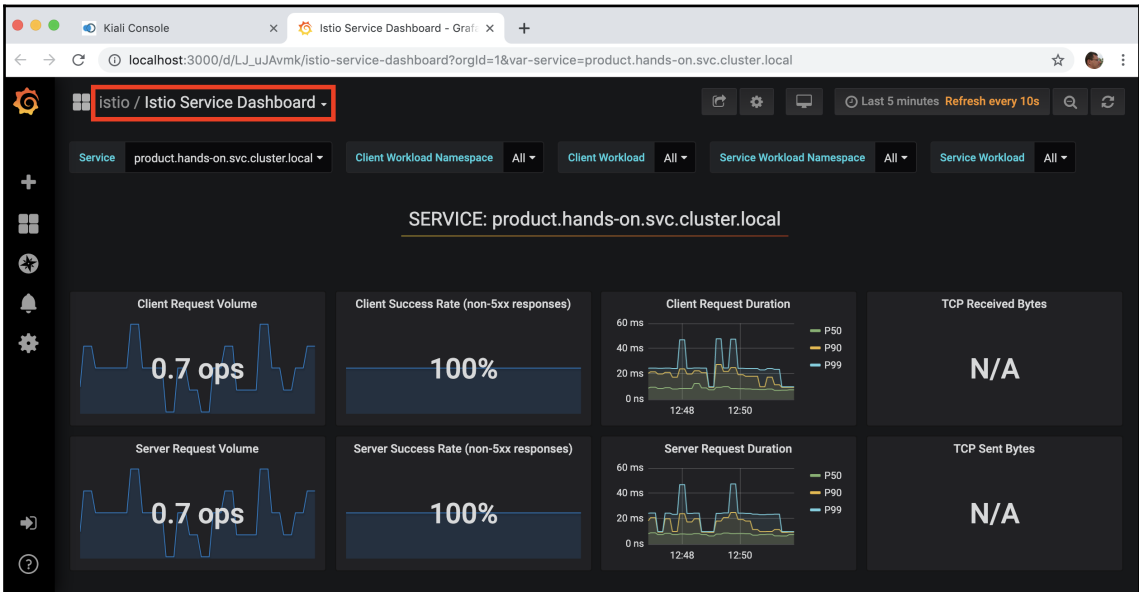
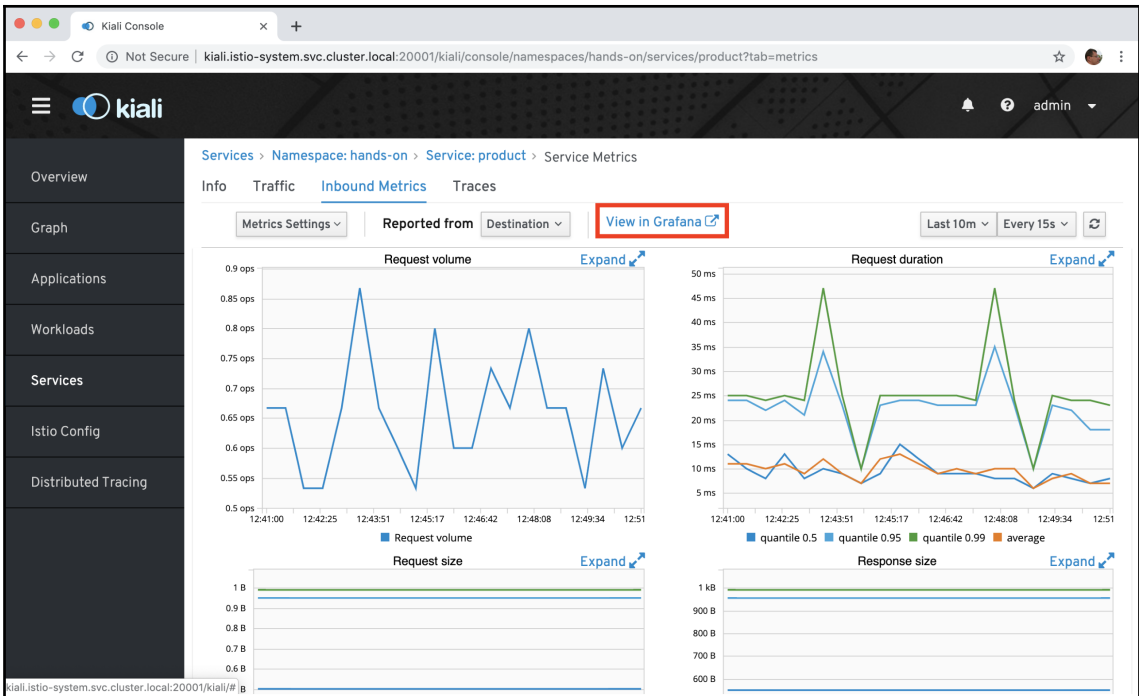
Table

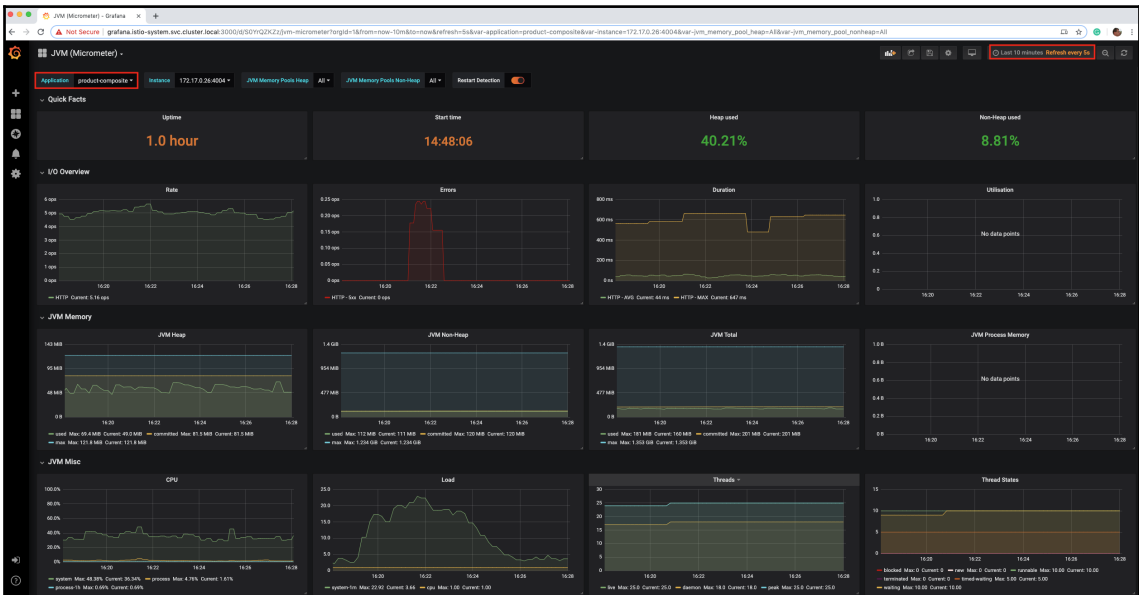
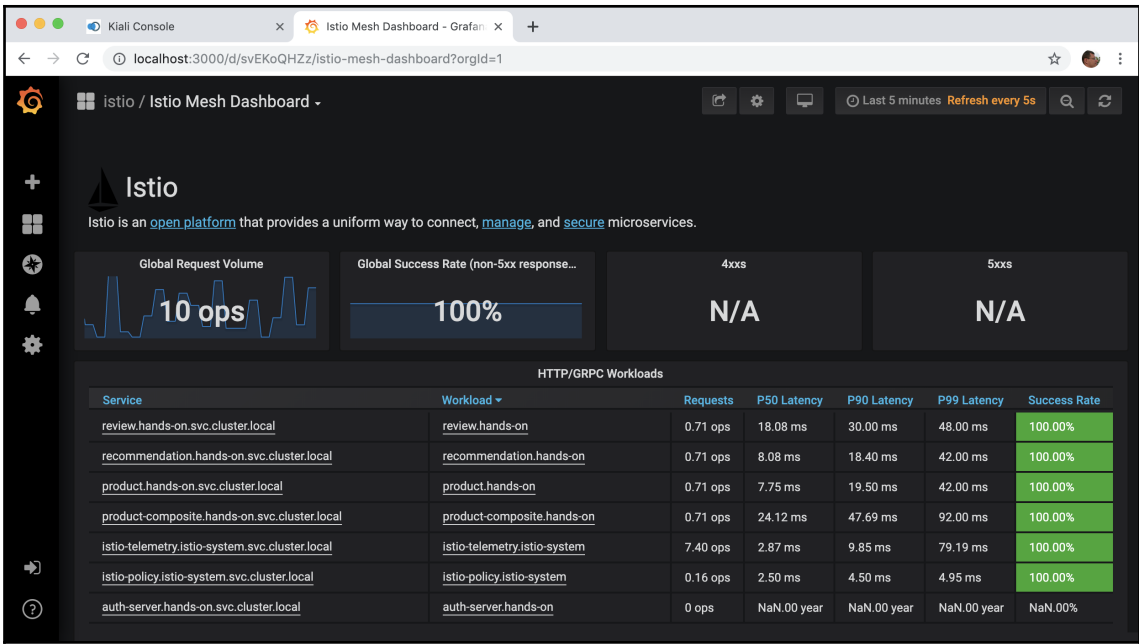
JSON

@timestamp	Aug 25, 2019 @ 18:35:33.255
_id	FheiyWwBo8TdMbqKDumU
_index	logstash-2019.08.25

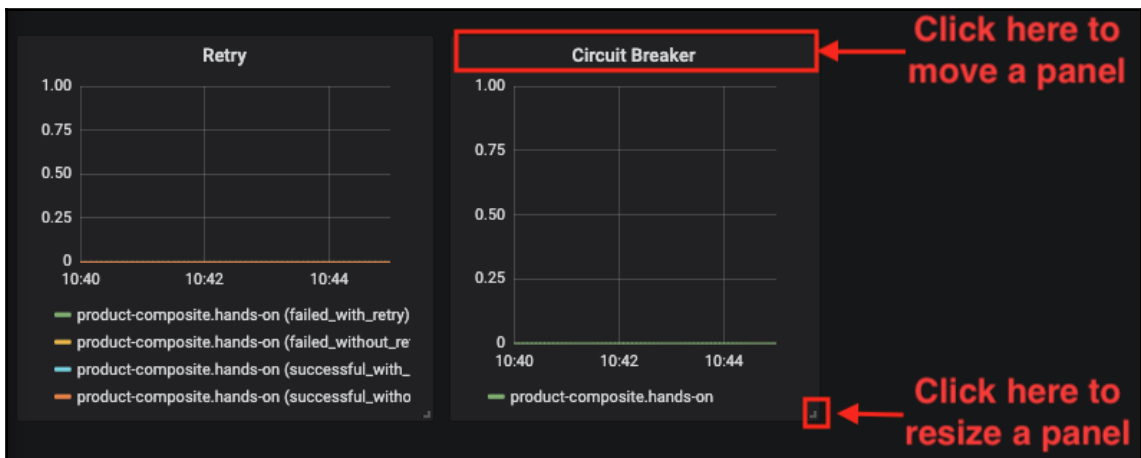
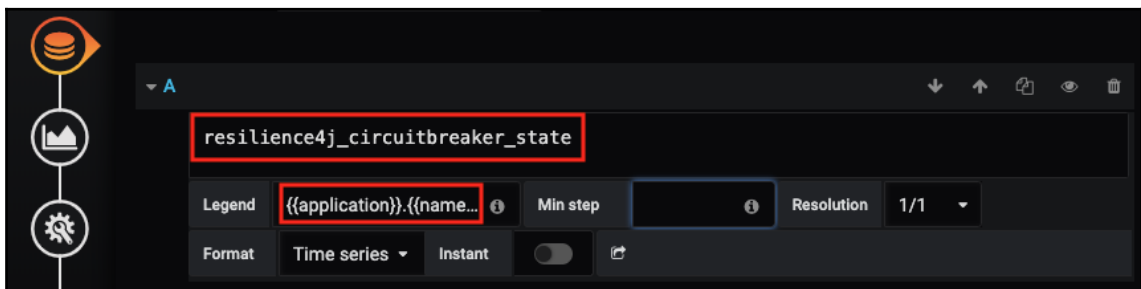
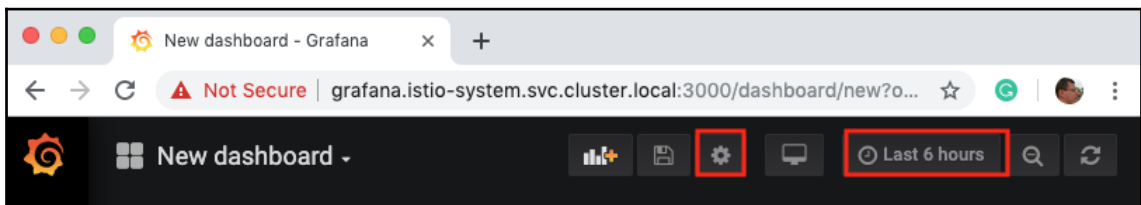
Chapter 20: Monitoring Microservices

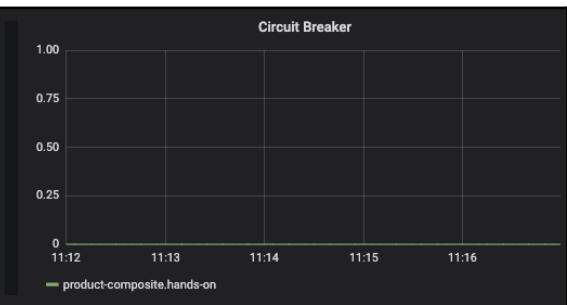
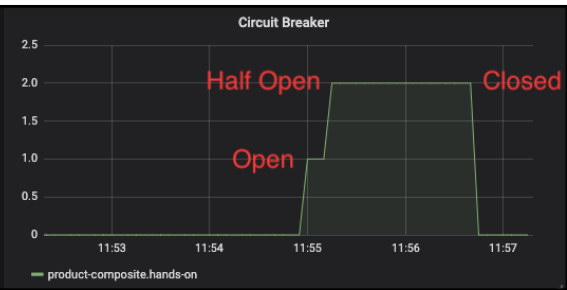






```
4. bash
$ curl http://product-composite.hands-on.svc.cluster.local:4004/actuator/prometheus -s
...
resilience4j_retry_calls{application="product-composite",kind="successful_with_retry",name="product",} 0.0
resilience4j_retry_calls{application="product-composite",kind="failed_with_retry",name="product",} 0.0
resilience4j_retry_calls{application="product-composite",kind="successful_without_retry",name="product",} 5610.0
resilience4j_retry_calls{application="product-composite",kind="failed_without_retry",name="product",} 75.0
...
resilience4j_circuitbreaker_state{application="product-composite",name="product",} 0.0
...
$
```





Edit Notification Channel

Name	mail
Type	Email ▾
Send on all alerts	 ☒
Include image	 ☒
Disable Resolve Message	 ☐
Send reminders	 ☐

Email addresses

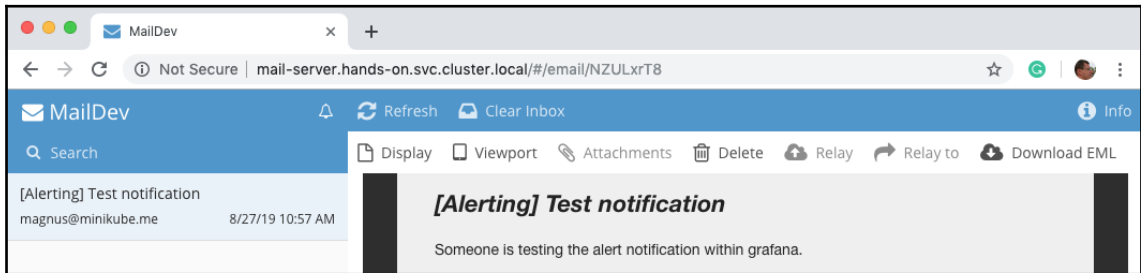
magnus@minikube.me

You can enter multiple email addresses using a ";" separator

Save

Send Test

Back



Rule

Name

Circuit Breaker alert

Evaluate every

10s

For

0

Conditions

WHEN

max ()

OF

query (A, 1m, now)

IS ABOVE

0.5

+

Visualization

Alert List

Options

Show

Recent state changes

Max items

10

Alerts from this dashboard

