

第

5

节

将PetClinic微服务部署到Docker Compose环境

本课内容

- 将SC版Petclinic微服务部署到Docker Compose环境
- 演示SC版Petclinic微服务基本功能
 - Petclinic界面展示(AngularJS前端)
 - Eureka Discovery Server
 - Admin Server
 - Zipkin Tracing Server
 - Prometheus
 - Grafana Dashboard + JMeter



确保Docker环境的CPU/Memory资源足够



将SC版PetClinic微服务部署到Docker-Compose环境

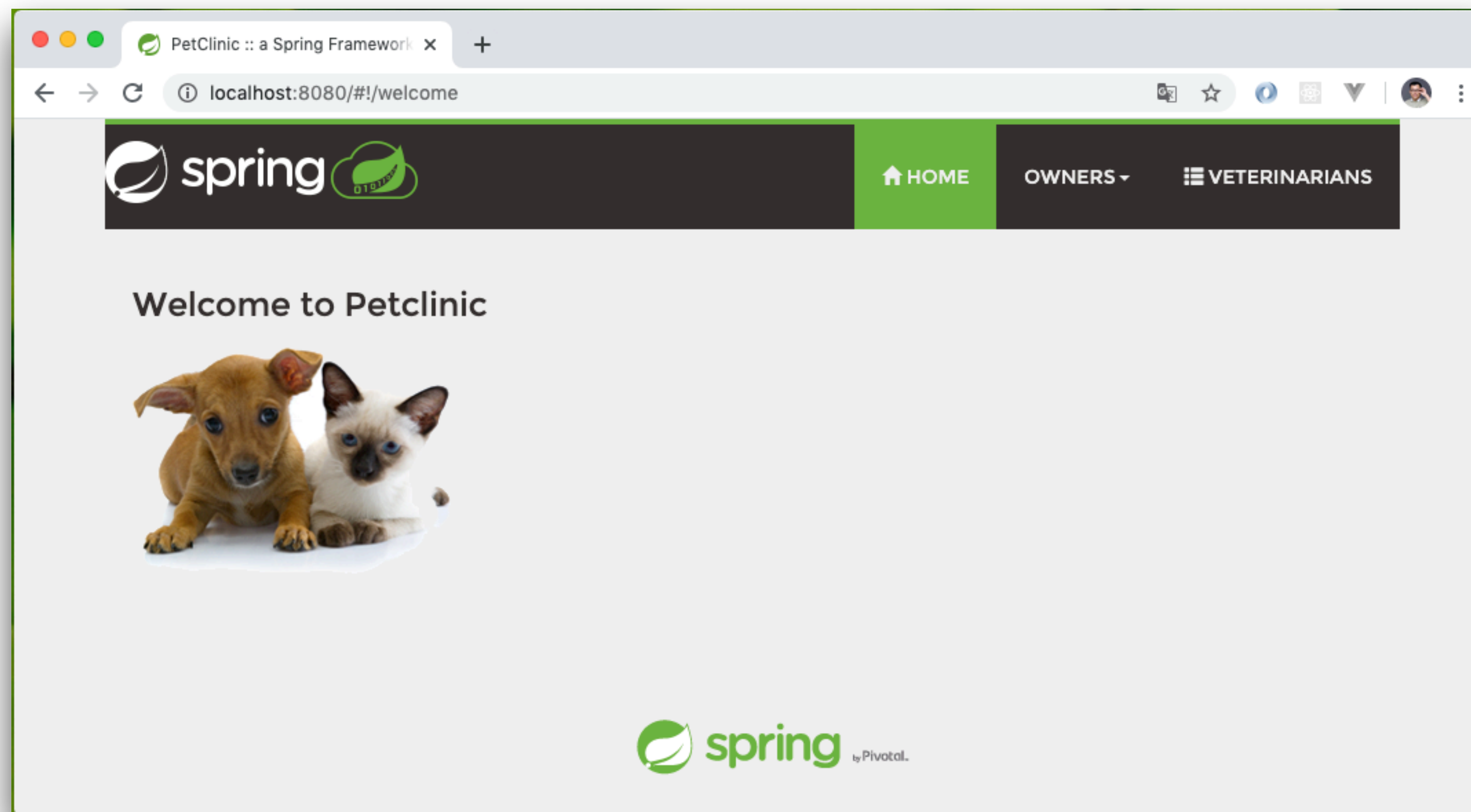
```
1. william@jskill: ~/mydev/github/spring2go/spring-petclinic-microservices (zsh)
→ spring-petclinic-microservices git:(master) x pwd
/Users/william/mydev/github/spring2go/spring-petclinic-microservices
→ spring-petclinic-microservices git:(master) x docker-compose up
```

```
1. docker-compose up (docker-compose)
customers-service | 2020-02-23 08:15:54.873 INFO [customers-service,,,] 16 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient : Application is null : false
customers-service | 2020-02-23 08:15:54.873 INFO [customers-service,,,] 16 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient : Registered Applications size is zero : true
customers-service | 2020-02-23 08:15:54.873 INFO [customers-service,,,] 16 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient : Application version is -1: false
customers-service | 2020-02-23 08:15:54.874 INFO [customers-service,,,] 16 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient : Getting all instance registry info from the eureka server
customers-service | 2020-02-23 08:15:54.905 INFO [customers-service,,,] 16 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient : The response status is 200
visits-service | 2020-02-23 08:15:56.385 INFO [visits-service,,,] 16 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient : Disable delta property : false
visits-service | 2020-02-23 08:15:56.390 INFO [visits-service,,,] 16 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient : Single vip registry refresh property : null
visits-service | 2020-02-23 08:15:56.391 INFO [visits-service,,,] 16 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient : Force full registry fetch : false
visits-service | 2020-02-23 08:15:56.392 INFO [visits-service,,,] 16 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient : Application is null : false
visits-service | 2020-02-23 08:15:56.392 INFO [visits-service,,,] 16 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient : Registered Applications size is zero : true
visits-service | 2020-02-23 08:15:56.393 INFO [visits-service,,,] 16 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient : Application version is -1: false
visits-service | 2020-02-23 08:15:56.393 INFO [visits-service,,,] 16 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient : Getting all instance registry info from the eureka server
visits-service | 2020-02-23 08:15:56.424 INFO [visits-service,,,] 16 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient : The response status is 200
```

服务和端口

服务	端口
Petclinic主界面(Angularjs前端)	http://localhost:8080
Eureka Discovery Server	http://localhost:8761
Spring Boot Admin Server	http://localhost:9090
Zipkin Tracing Server	http://localhost:9411/zipkin/
Promethues	http://localhost:9091
Grafana Dashboards	http://localhost:3000
Customers, Vets & Visits Services	Eureka Dashboard查看

PetClinic主界面



Eureka Discovery Server UI

The screenshot shows the Spring Eureka Discovery Server UI in a web browser. The browser tabs include 'PetClinic - a Spring Framework' and 'Eureka'. The address bar shows 'localhost:8761'. The page has a dark header with the 'spring Eureka' logo and navigation links for 'HOME' and 'LAST 1000 SINCE STARTUP'.

System Status

Environment	test	Current time	2020-02-23T08:25:20 +0000
Data center	default	Uptime	00:11
		Lease expiration enabled	false
		Renews threshold	10
		Renews (last min)	10

EMERGENCY! EUREKA MAY BE INCORRECTLY CLAIMING INSTANCES ARE UP WHEN THEY'RE NOT. RENEWALS ARE LESSER THAN THRESHOLD AND HENCE THE INSTANCES ARE NOT BEING EXPIRED JUST TO BE SAFE.

DS Replicas

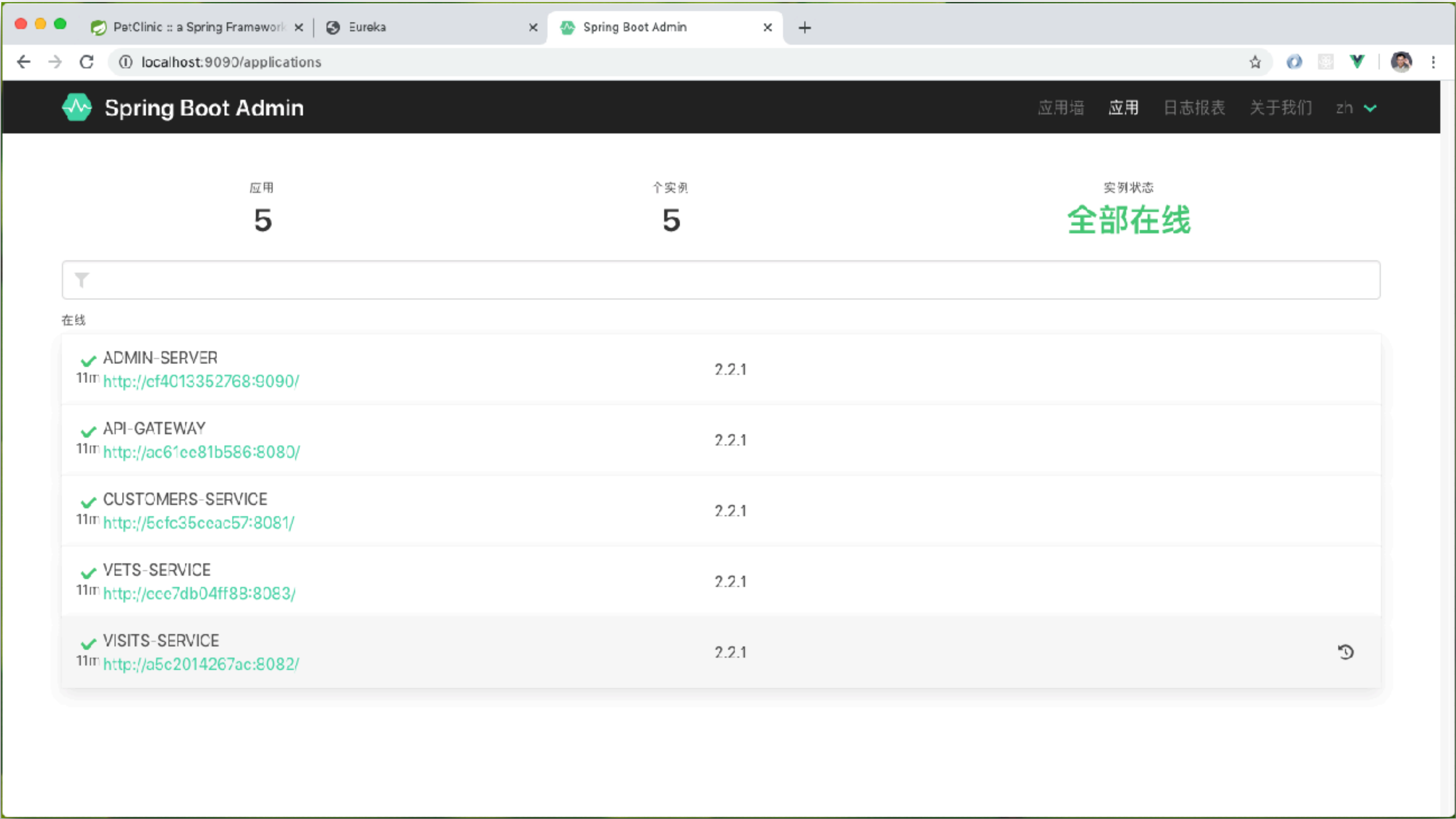
Instances currently registered with Eureka

Application	AMIs	Availability Zones	Status
ADMIN-SERVER	n/a (1)	(1)	UP (1) - ef4013352768:admin-server:9090
API-GATEWAY	n/a (1)	(1)	UP (1) - ac61ee81b586:api-gateway:8080
CUSTOMERS-SERVICE	n/a (1)	(1)	UP (1) - 5cfc35ceac57:customers-service:8081
VETS-SERVICE	n/a (1)	(1)	UP (1) - eee7db04ff88:vets-service:8083
VISITS-SERVICE	n/a (1)	(1)	UP (1) - a5c2014267ac:visits-service:8082

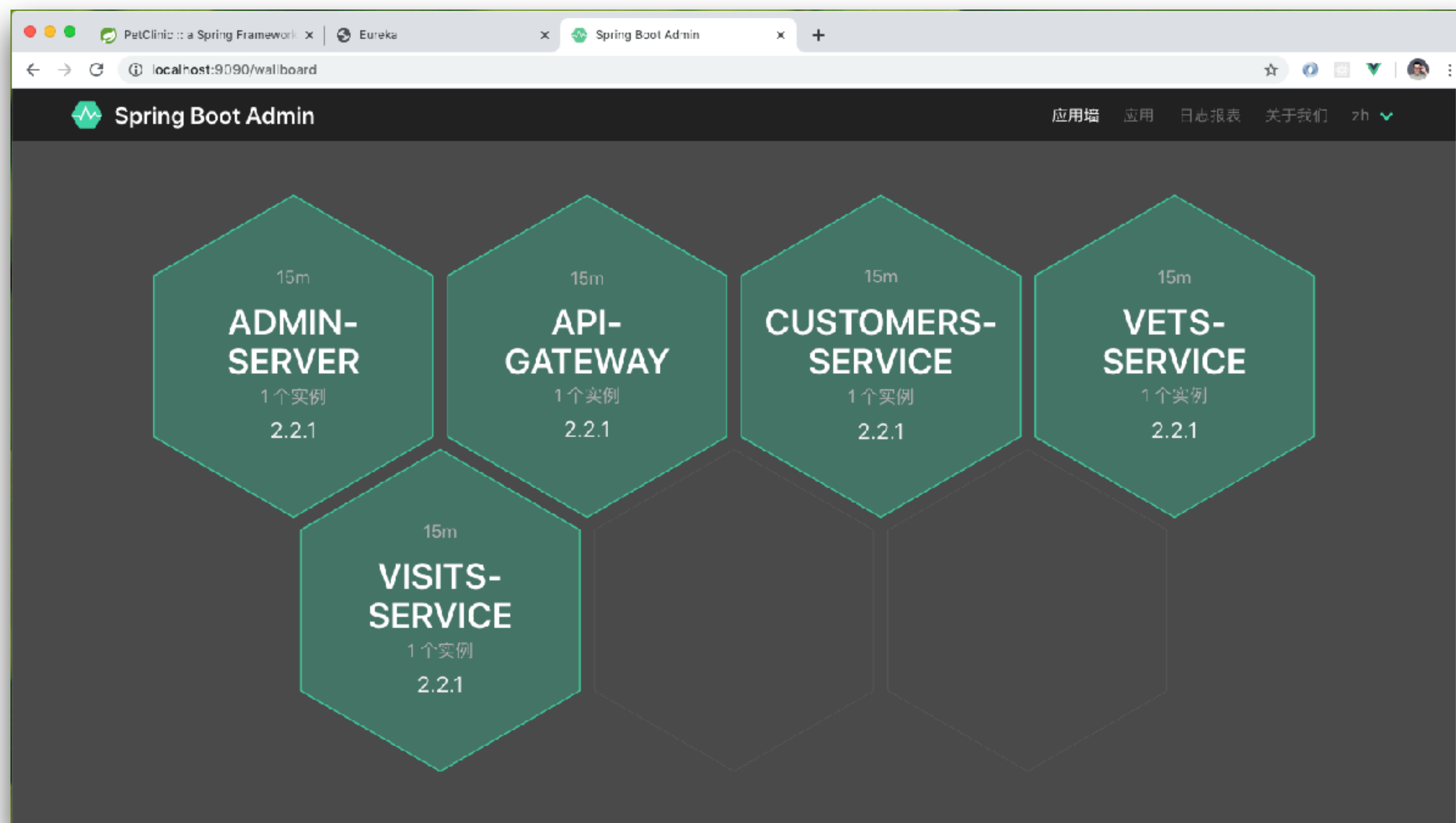
General Info

Name	Value
total-avail-memory	44mb
environment	test
num-of-cpus	4
current-memory-usage	32mb (72%)

Spring Boot Admin Server UI



Spring Boot Admin应用墙



Zipkin Tracing Server UI

The screenshot displays the Zipkin Tracing Server UI in a web browser. The browser's address bar shows the URL: `localhost:9411/zipkin/?serviceName=all&spanName=all&remoteServiceName=all&lookback=900000&startTs=1582445809079&endTs=1582446709079&annotationQ...`. The UI features a dark header with the Zipkin logo, navigation links (查找, 已保存, 依赖), a "Try Lens UI" button, and a search input field labeled "请输入traceid" with a "搜索" button.

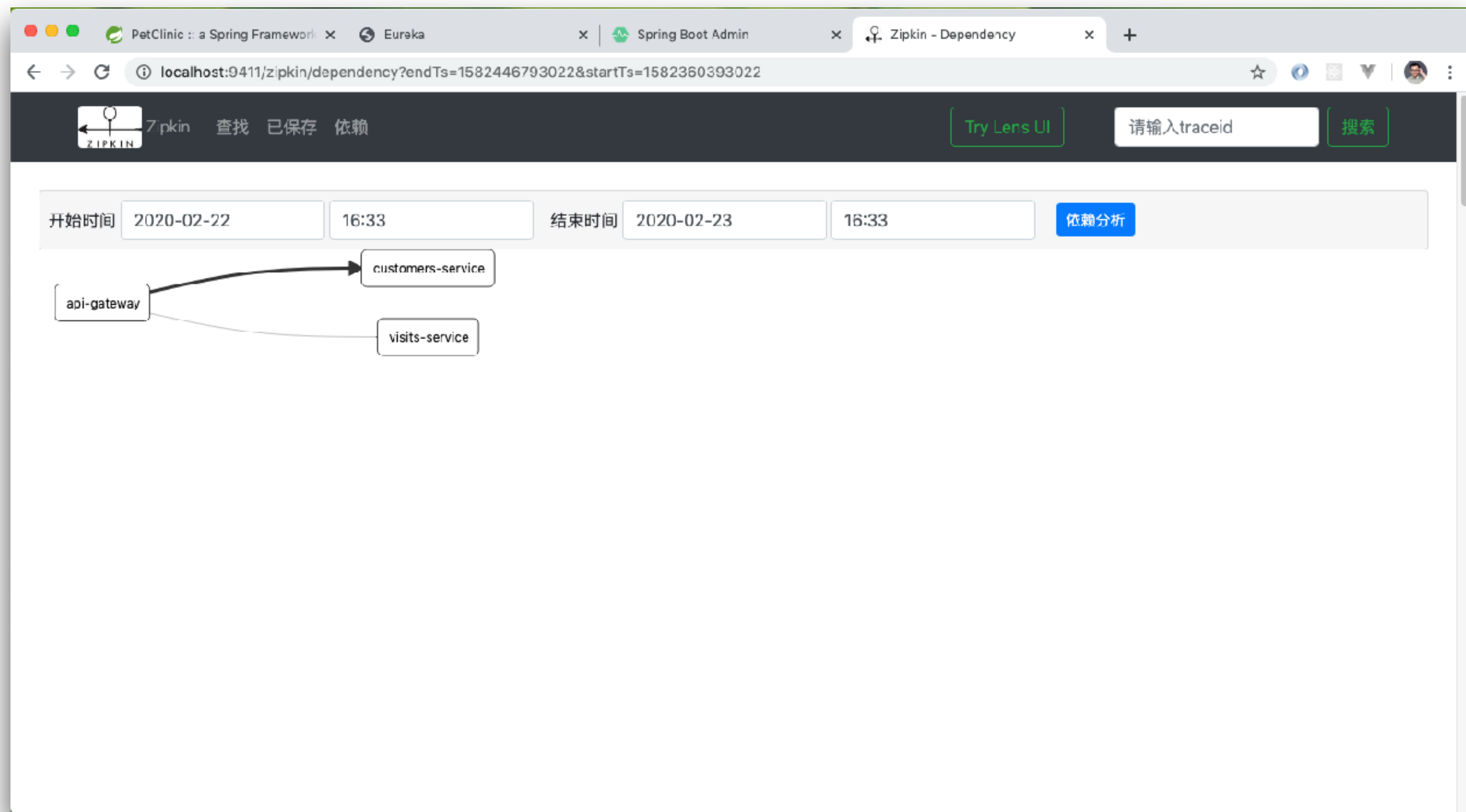
The main content area contains search filters and a list of traces. The filters include:

- 服务名 (Service Name): `all`
- Span名称 (Span Name): `all`
- 远程服务名 (Remote Service Name): `all`
- 时间 (Time): `15 分钟`
- 根据Annotation查询 (Query by Annotation): `For example: http.path=/foo/bar/ and cluster=foo and cache.miss`
- 持续时间 (μs) >= (Duration >=): `Ex: 100ms or 5s`
- 数量 (Count): `10`
- 排序 (Sort): `耗时降序`

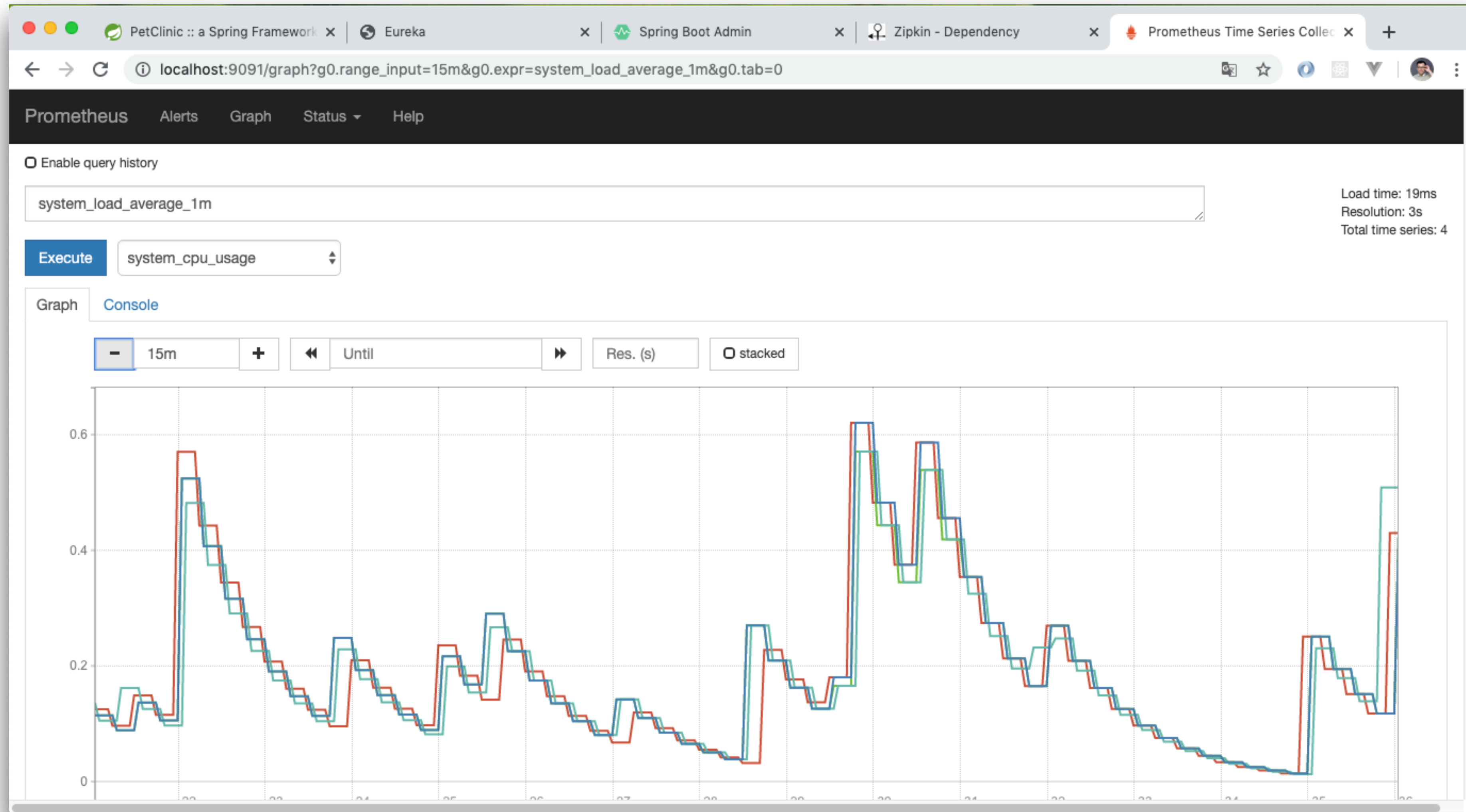
A "查找" (Search) button and a "JSON" download button are also present. Below the filters, the UI shows a list of traces with the following details:

Trace ID	Spans	Services	Time
557.501ms	5 spans	api-gateway x3 557.501ms, visits-service x1 301.838ms, customers-service x1 18.702ms	9 minutes ago
92.035ms	3 spans	api-gateway x2 91.083ms, customers-service x1 82.424ms	9 minutes ago
91.841ms	1 spans	vets-service x1 91.841ms	2 minutes ago
47.987ms	5 spans	api-gateway x3 47.987ms, customers-service x1 15.147ms, visits-service x1 10.907ms	9 minutes ago

Zipkin服务依赖图



Prometheus UI



Prometheus监控目标

The screenshot shows the Prometheus web interface at localhost:9091/targets. The page displays four target groups, each with a table of endpoints, their states, labels, last scrape times, and any errors.

Targets

api-gateway (1/1 up) [show less](#)

Endpoint	State	Labels	Last Scrape	Error
http://api-gateway:8080/actuator/prometheus	UP	instance="api-gateway:8080"	11.741s ago	

customers-service (1/1 up) [show less](#)

Endpoint	State	Labels	Last Scrape	Error
http://customers-service:8081/actuator/prometheus	UP	instance="customers-service:8081"	8.273s ago	

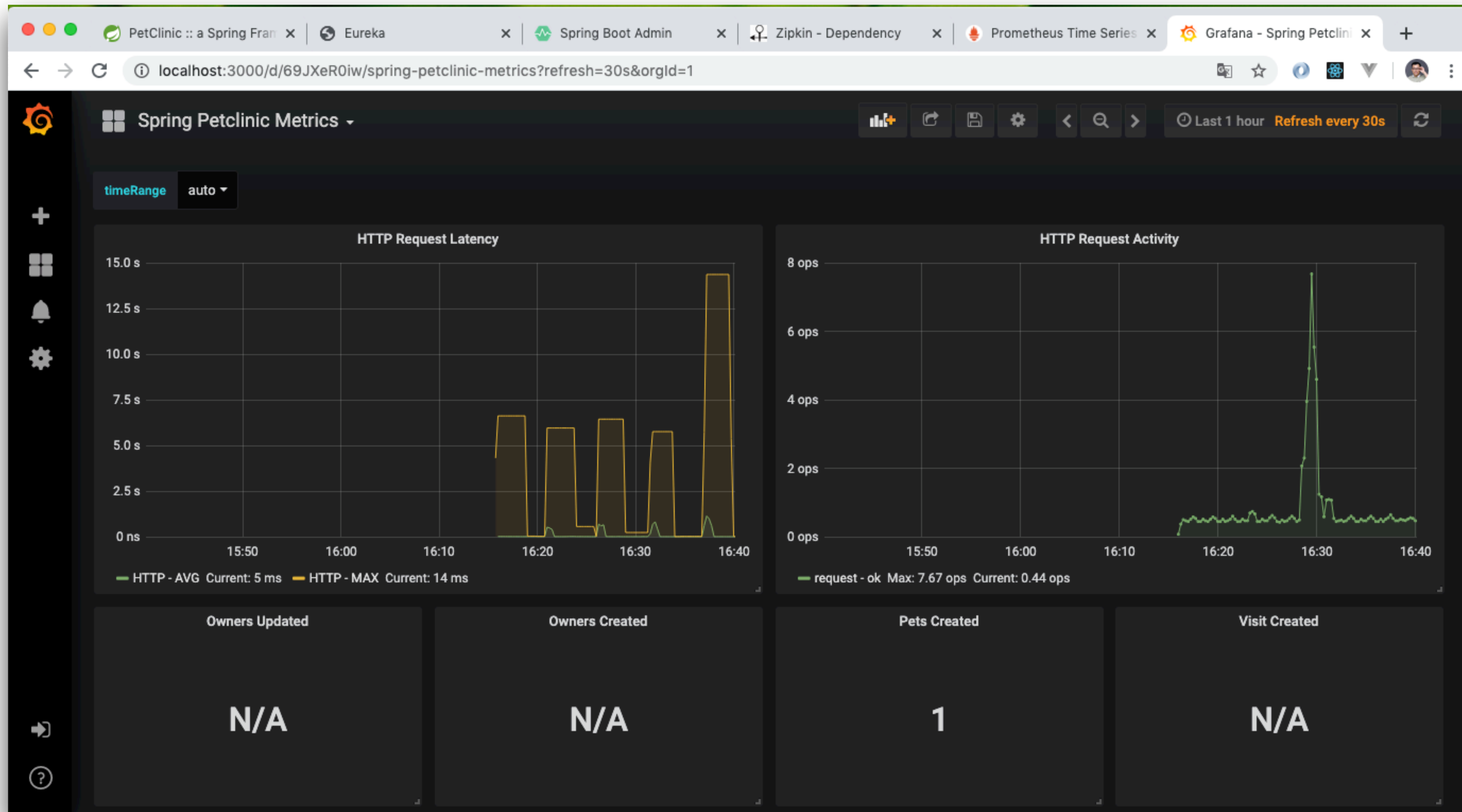
prometheus (1/1 up) [show less](#)

Endpoint	State	Labels	Last Scrape	Error
http://localhost:9090/metrics	UP	instance="localhost:9090"	6.291s ago	

vets-service (1/1 up) [show less](#)

Endpoint	State	Labels	Last Scrape	Error
http://vets-service:8083/actuator/prometheus	UP	instance="vets-service:8083"	3.891s ago	

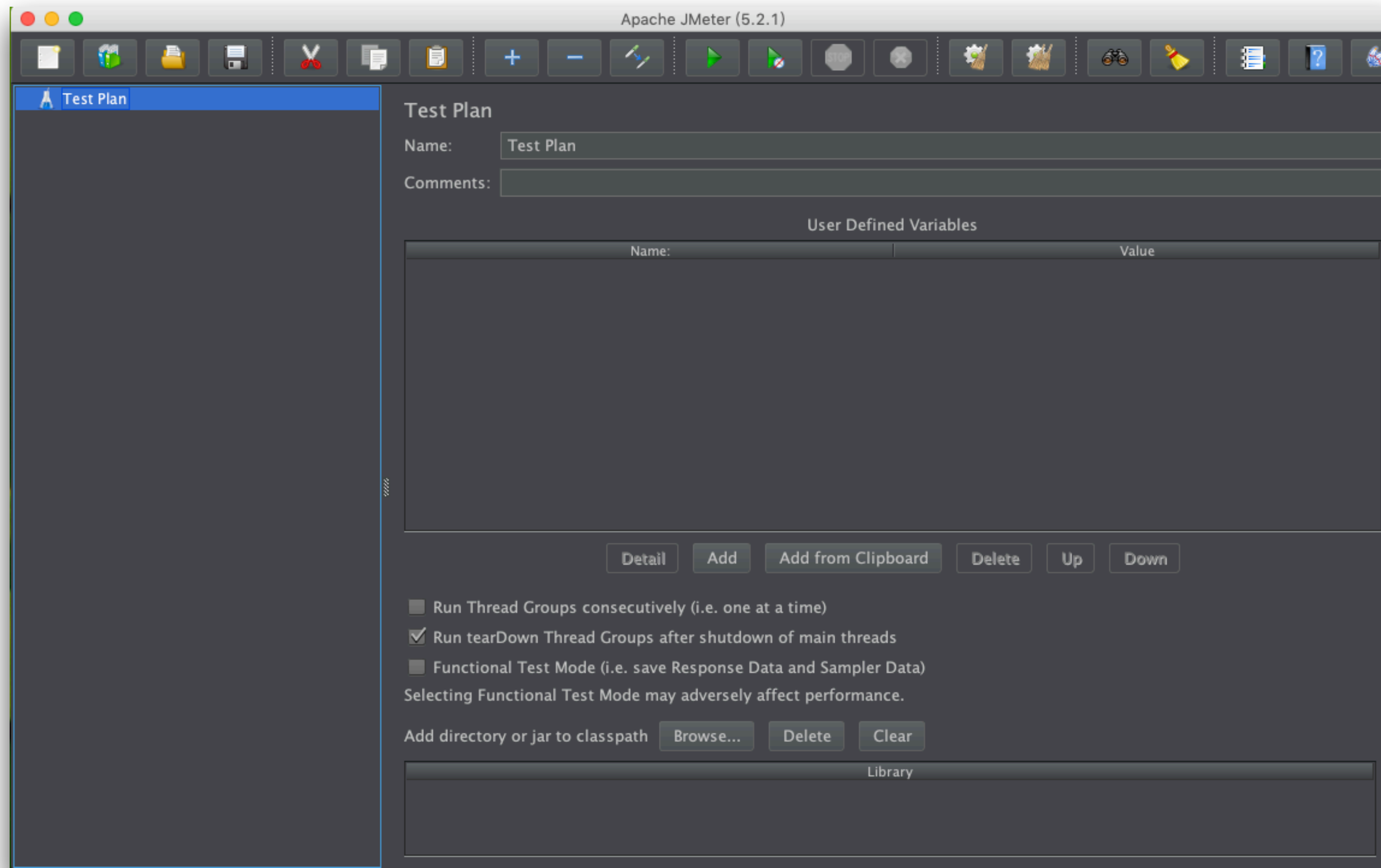
Grafana Dashboard ~ Spring Petclinic Metrics



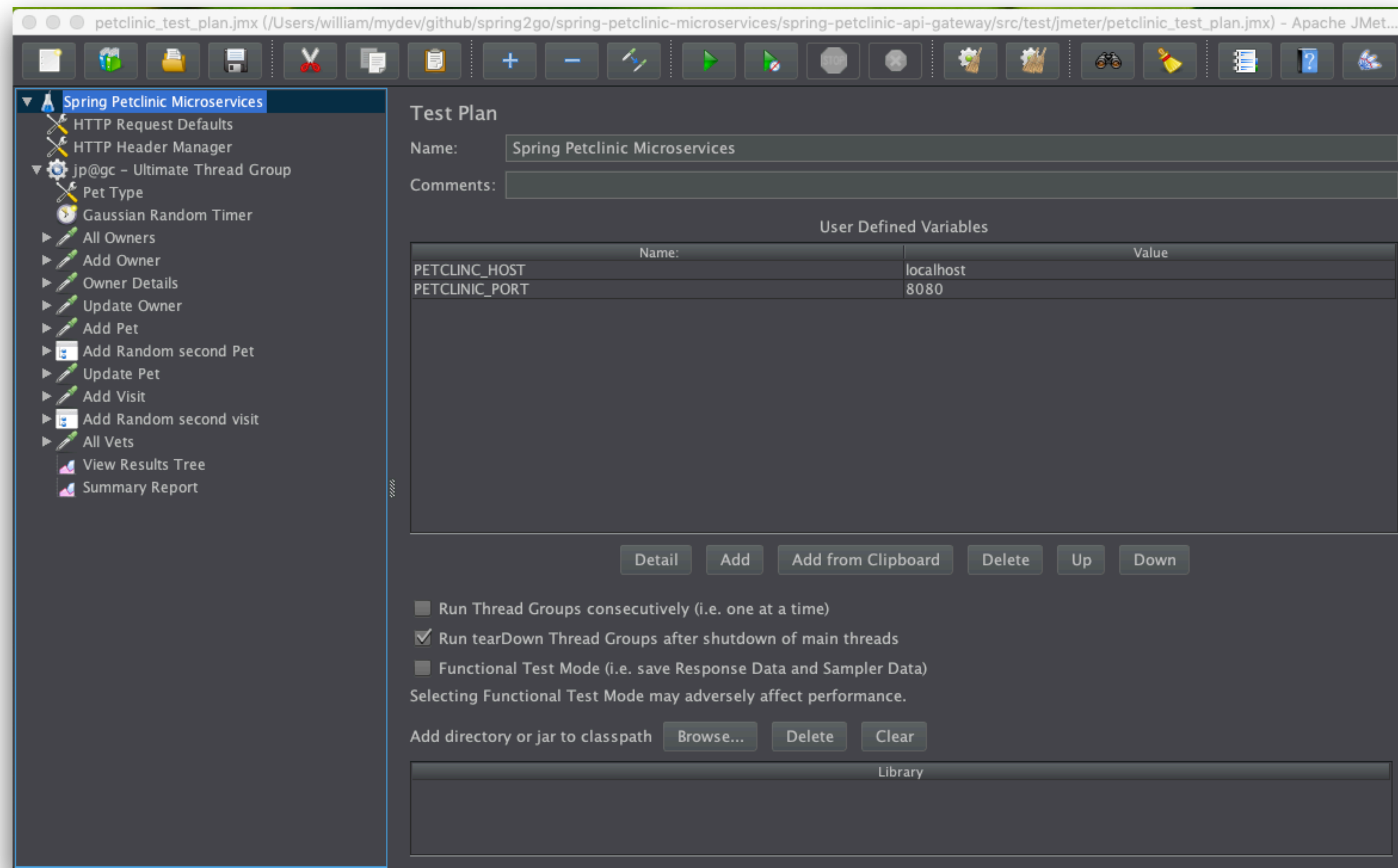
Apache JMeter

http://jmeter.apache.org/download_jmeter.cgi

<https://jmeter-plugins.org/install/Install/>

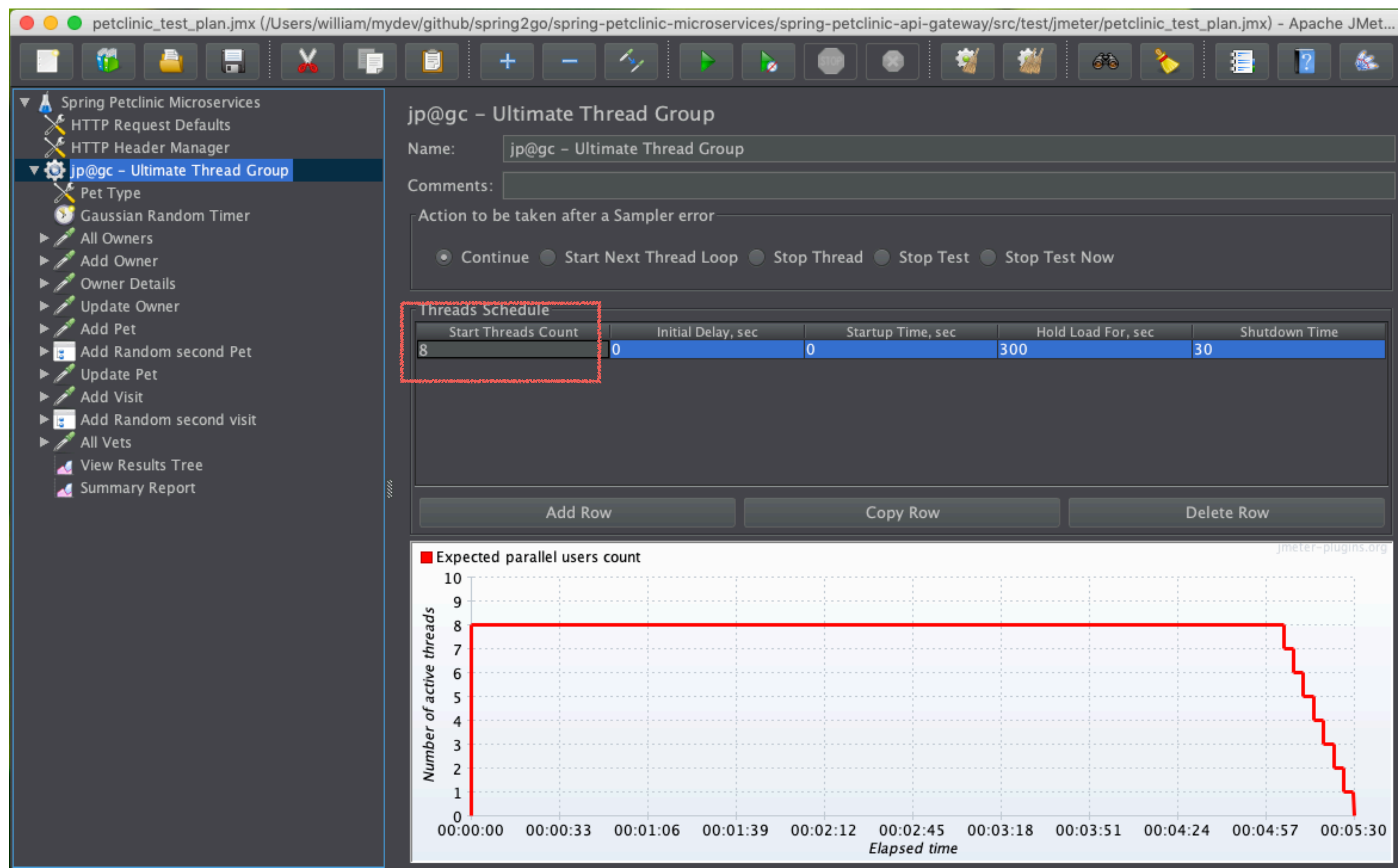


加载Test Plan

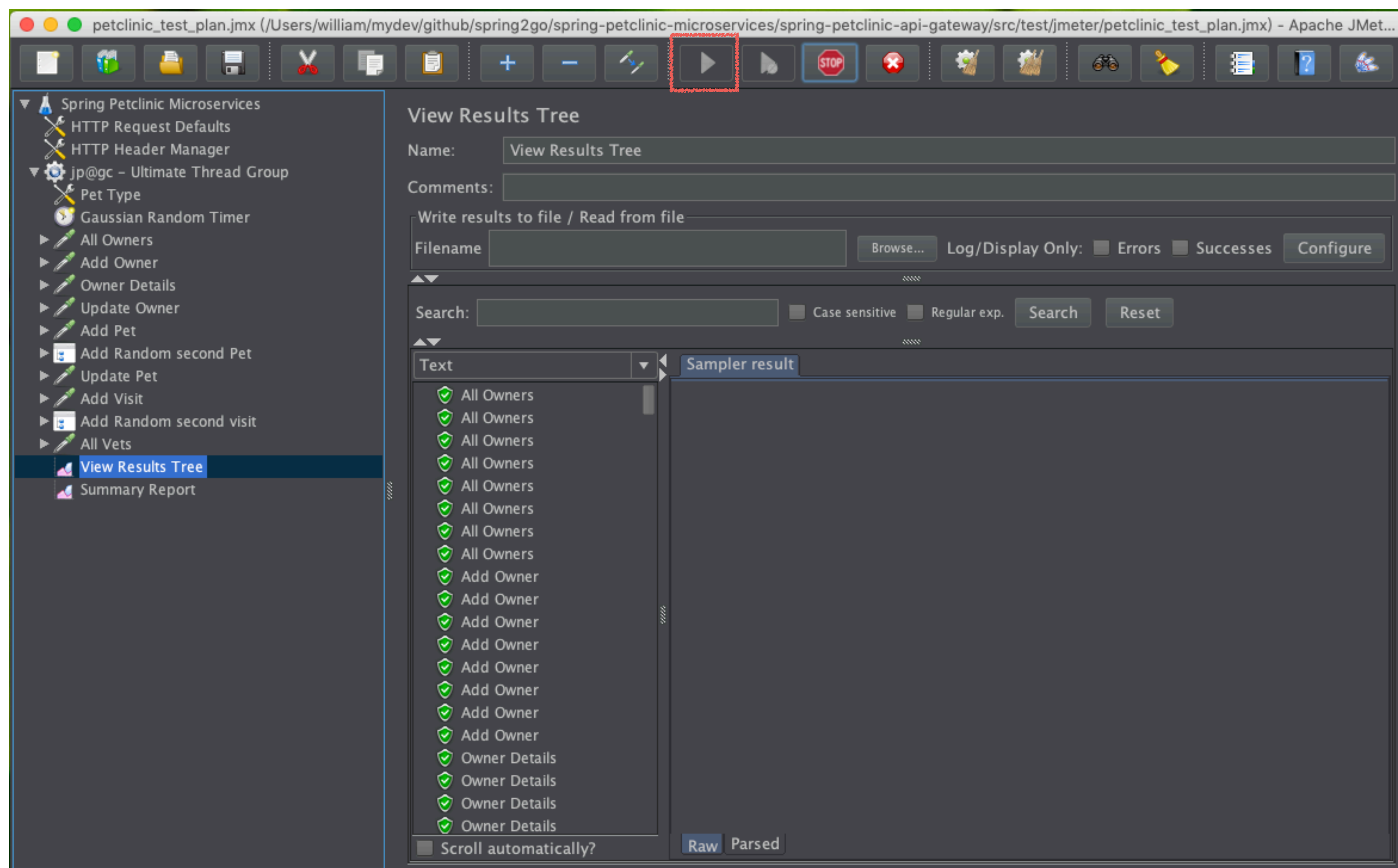


<https://github.com/spring2go/spring-petclinic-microservices/tree/master/spring-petclinic-api-gateway/src/test/jmeter>

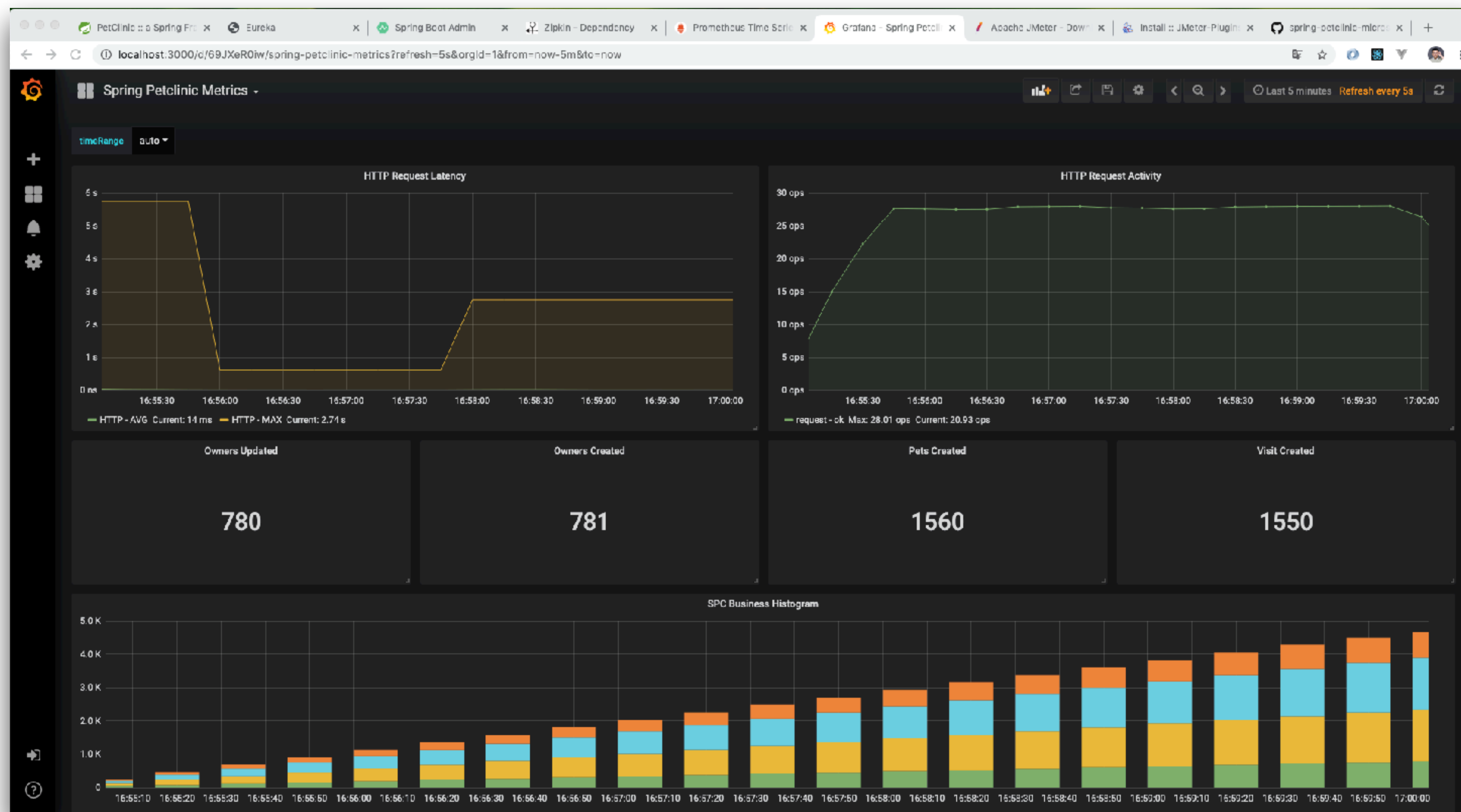
调整线程数



启动压测



Grafana Dashboard查看指标变化



清理环境

```
1. william@jskill: ~/mydev/github/spring2go/spring-petclinic-microservices (zsh)
X ..microservices (zsh) 1
X ..ter-5.2.1/bin (zsh) 2
X ..microservices (zsh) 3

→ spring-petclinic-microservices git:(master) x pwd
/Users/william/mydev/github/spring2go/spring-petclinic-microservices

→ spring-petclinic-microservices git:(master) x ls
LICENSE mvnw spring-petclinic-customers-service
README.md mvnw.cmd spring-petclinic-discovery-server
config-copy pom.xml spring-petclinic-microservices.iml
docker spring-petclinic-admin-server spring-petclinic-vets-service
docker-compose.yml spring-petclinic-api-gateway spring-petclinic-visits-service
docs spring-petclinic-config-server

→ spring-petclinic-microservices git:(master) x docker-compose down
Stopping customers-service ... done
Stopping vets-service ... done
Stopping admin-server ... done
Stopping api-gateway ... done
Stopping visits-service ... done
Stopping discovery-server ... done
Stopping config-server ... done
Stopping grafana-server ... done
Stopping tracing-server ... done
Stopping prometheus-server ... done
Removing customers-service ... done
Removing vets-service ... done
Removing admin-server ... done
Removing api-gateway ... done
Removing visits-service ... done
Removing discovery-server ... done
Removing config-server ... done
Removing grafana-server ... done
Removing tracing-server ... done
Removing prometheus-server ... done
Removing network spring-petclinic-microservices_default

→ spring-petclinic-microservices git:(master) x
```

本课小结



- 演示将SC版PetClinic微服务部署到本地Docker-Compose环境
 - docker-compose up 一键启动
 - docker-compose down 一键关闭
- 演示SC版PetClinic微服务的基本功能
 - Angularjs主界面
 - Eureka Server UI ~ 服务注册中心
 - Admin Server UI ~ 监控/配置服务实例内部状态
 - Zipkin Tracing Server UI ~ 调用链和依赖监控
 - Promethues ~ Metrics监控作图
 - Grafana Dashboard + JMeter ~ Metrics展示 + 压测