

第 10 节

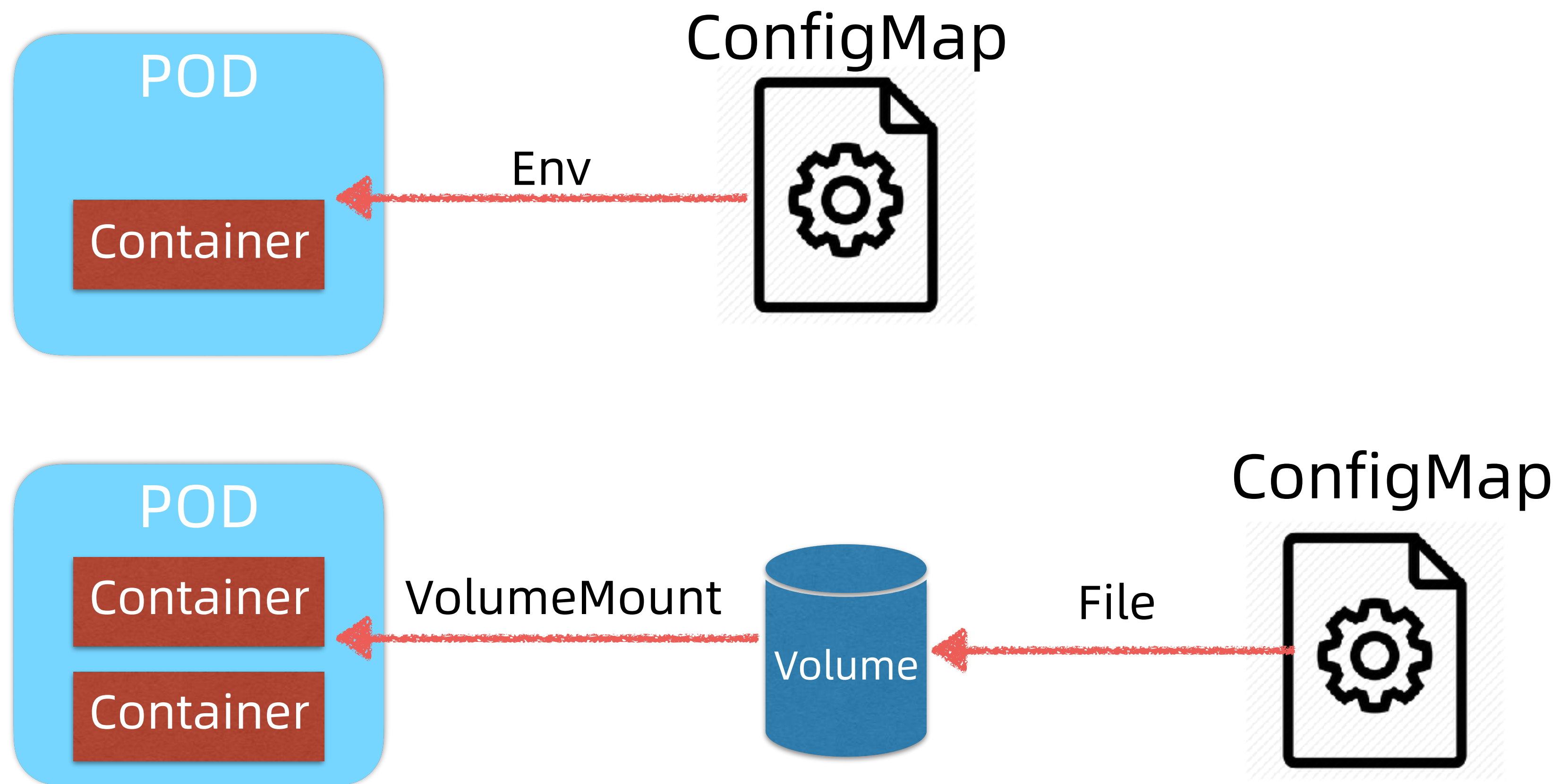
K8s配置抽象ConfigMap

本课内容

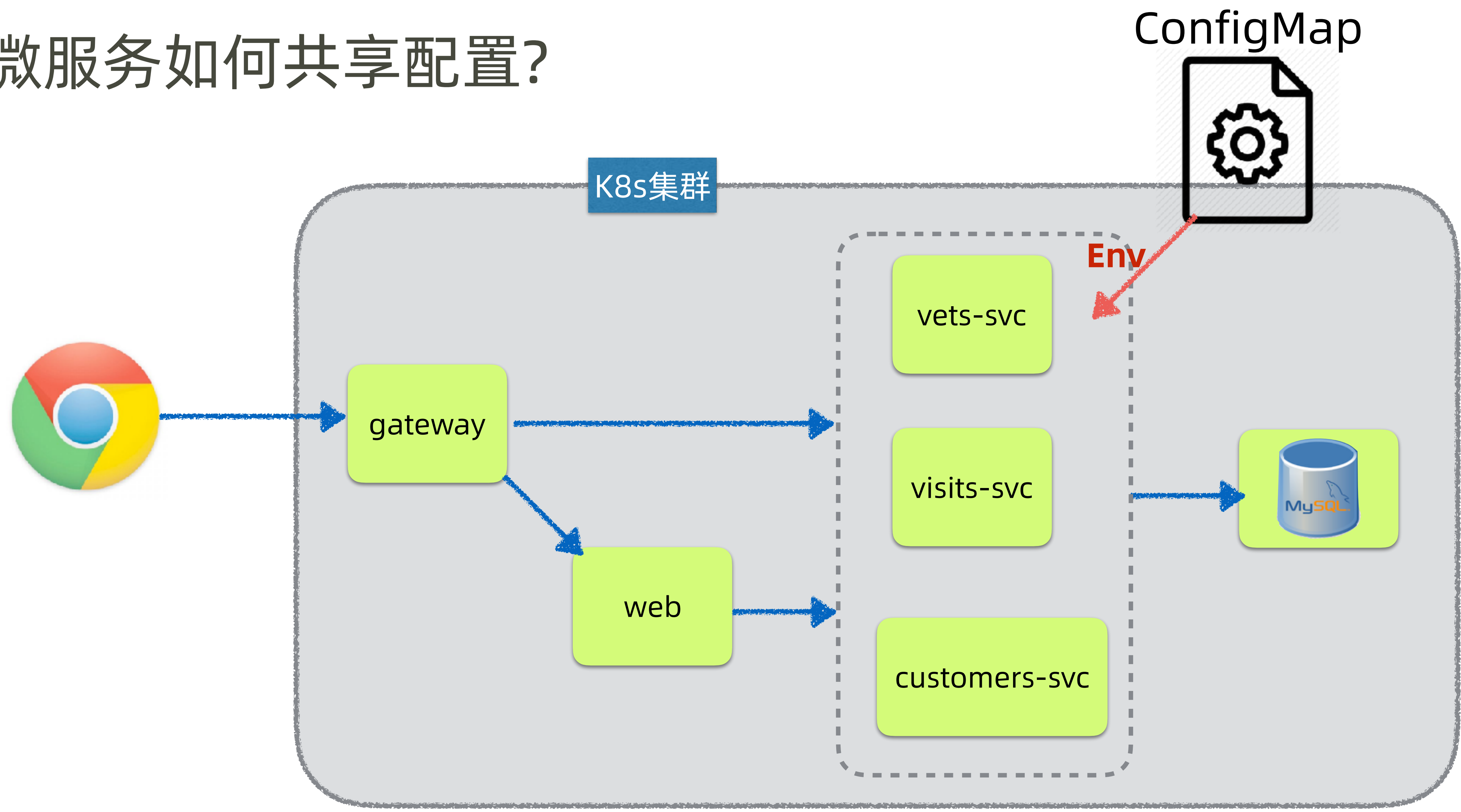
- K8s配置抽象ConfigMap的原理
- Petclinic + ConfigMap演示
- ConfigMap配置更新传播



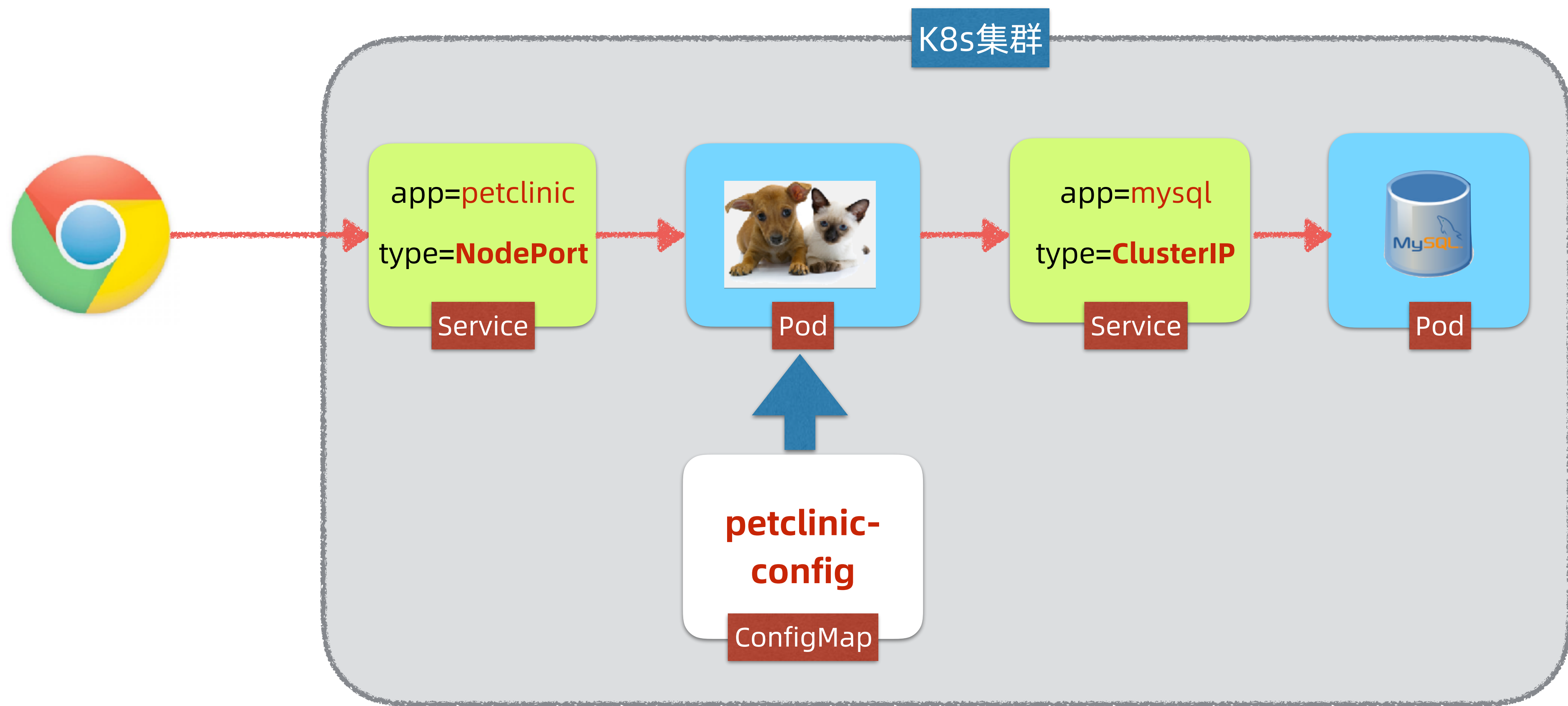
K8s配置抽象ConfigMap



微服务如何共享配置？

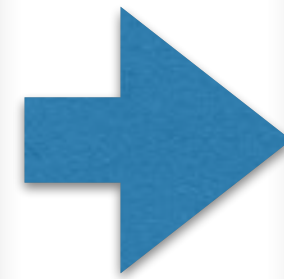


演示部署架构



Env -> ConfigMap

```
spec:
  containers:
  - name: petclinic
    image: spring2go/spring-petclinic:1.0.1.RELEASE
    env:
      - name: SPRING_PROFILES_ACTIVE
        value: mysql
      - name: DATASOURCE_URL
        value: jdbc:mysql://mysql/petclinic
      - name: DATASOURCE_USERNAME
        value: root
      - name: DATASOURCE_PASSWORD
        value: petclinic
      - name: DATASOURCE_INIT_MODE
        value: always
```



```
1  apiVersion: v1
2  kind: ConfigMap
3  metadata:
4    name: petclinic-config
5  data:
6    SPRING_PROFILES_ACTIVE: mysql
7    DATASOURCE_URL: jdbc:mysql://mysql/petclinic
8    DATASOURCE_USERNAME: root
9    DATASOURCE_PASSWORD: petclinic
10   DATASOURCE_INIT_MODE: always
11   TEST_CONFIG: test_config_v1
```

Petclinic Deployment

```
1  apiVersion: apps/v1
2  kind: Deployment
3  metadata:
4    name: petclinic
5  spec:
6    selector:
7      matchLabels:
8        app: petclinic
9    replicas: 1
10   template:
11     metadata:
12       labels:
13         app: petclinic
14     spec:
15       containers:
16         - name: petclinic
17           image: spring2go/spring-petclinic:1.0.1.RELEASE
18           envFrom:
19             - configMapRef:
20               name: petclinic-config
```

发布petclinic-config.yml

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/10 (zsh)
→ 10 git:(master) x ls
mysql-svc.yml      petclinic-config.yml petclinic-svc.yml
→ 10 git:(master) x kubectl get all
NAME                TYPE          CLUSTER-IP    EXTERNAL-IP    PORT(S)    AGE
service/kubernetes  ClusterIP     10.96.0.1     <none>         443/TCP    37s
→ 10 git:(master) x kubectl apply -f petclinic-config.yml
configmap/petclinic-config created
→ 10 git:(master) x kubectl get cm
NAME          DATA  AGE
petclinic-config  6      25s
```


查看petclinic config详情

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/10 (zsh)
→ 10 git:(master) ✕ kubectl describe cm petclinic-config
Name:          petclinic-config
Namespace:     default
Labels:        <none>
Annotations:   kubectl.kubernetes.io/last-applied-configuration:
                {"apiVersion":"v1","data":{"DATASOURCE_INIT_MODE":"always","DATASOURCE_PASSWORD":"petclinic","DATASOURCE_URL":"jdbc:mysql://mysql/petclinic...

Data
====
DATASOURCE_PASSWORD:
----
petclinic
DATASOURCE_URL:
----
jdbc:mysql://mysql/petclinic
DATASOURCE_USERNAME:
----
root
SPRING_PROFILES_ACTIVE:
----
mysql
TEST_CONFIG:
----
test_config_v1
DATASOURCE_INIT_MODE:
----
always
Events: <none>
→ 10 git:(master) ✕
```

发布Mysql Service/Pod

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/10 (zsh)
→ 10 git:(master) x ls
mysql-svc.yml          petclinic-config.yml  petclinic-svc.yml
→ 10 git:(master) x kubectl apply -f mysql-svc.yml
pod/mysql created
service/mysql created
→ 10 git:(master) x kubectl get all
NAME                READY    STATUS    RESTARTS   AGE
pod/mysql           1/1      Running   0           4s

NAME                TYPE          CLUSTER-IP    EXTERNAL-IP  PORT(S)    AGE
service/kubernetes  ClusterIP     10.96.0.1     <none>       443/TCP    5m21s
service/mysql       ClusterIP     10.106.26.100 <none>       3306/TCP   4s
→ 10 git:(master) x
```

发布Petclinic Service/Pod

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/10 (zsh)
→ 10 git:(master) x ls
mysql-svc.yml      petclinic-config.yml petclinic-svc.yml
→ 10 git:(master) x kubectl apply -f petclinic-svc.yml
deployment.apps/petclinic created
service/petclinic created
→ 10 git:(master) x kubectl get all
NAME                                READY   STATUS    RESTARTS   AGE
pod/mysql                           1/1     Running   0           3m9s
pod/petclinic-56cdc78545-sf66d      1/1     Running   0           21s

NAME                                TYPE                CLUSTER-IP      EXTERNAL-IP   PORT(S)          AGE
service/kubernetes                  ClusterIP           10.96.0.1       <none>        443/TCP          8m26s
service/mysql                       ClusterIP           10.106.26.100   <none>        3306/TCP          3m9s
service/petclinic                   NodePort            10.97.51.228    <none>        8080:31080/TCP   21s

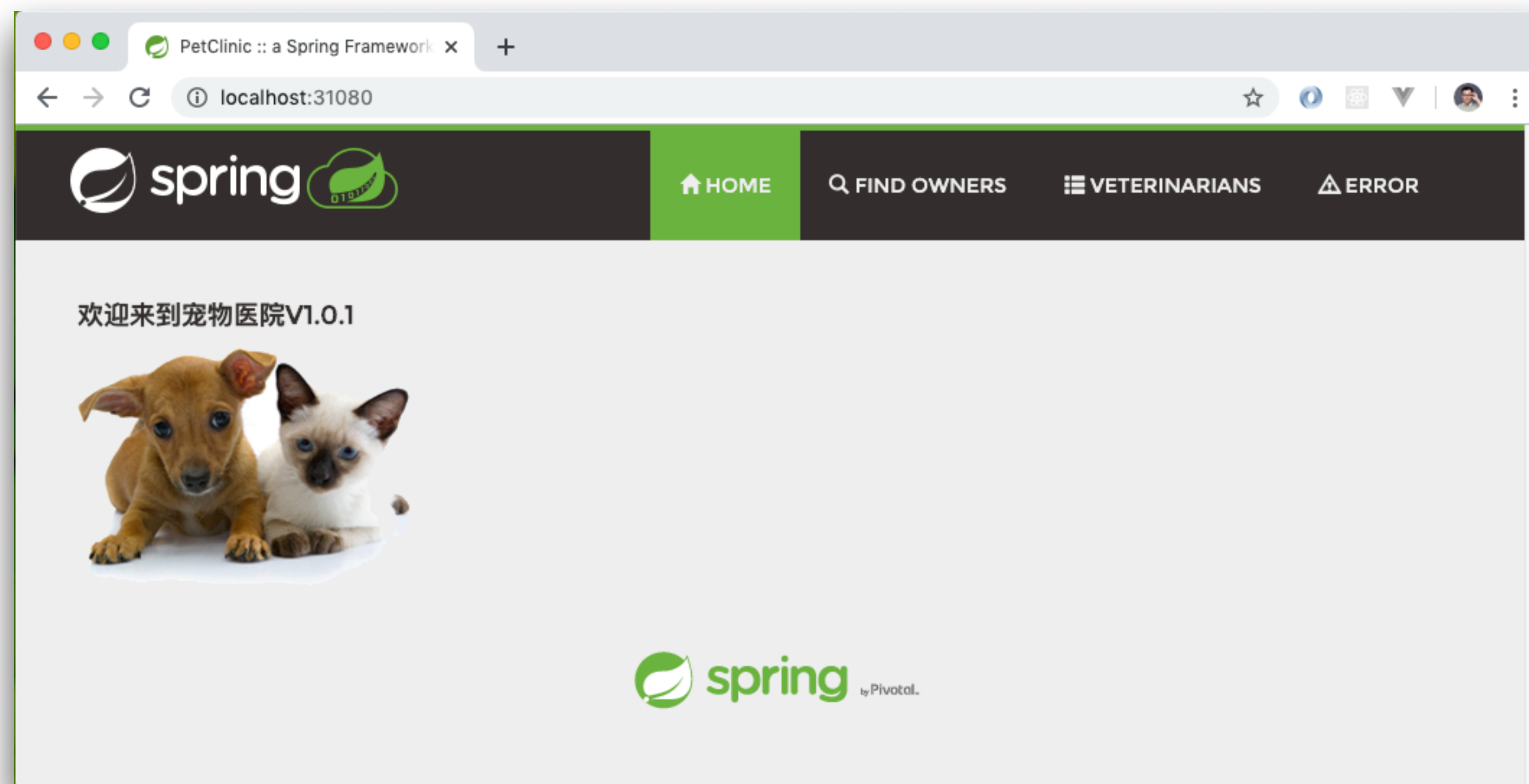
NAME                                READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/petclinic            1/1     1             1           21s

NAME                                DESIRED   CURRENT   READY   AGE
replicaset.apps/petclinic-56cdc78545 1         1         1       21s
→ 10 git:(master) x
```

校验Petclinic Pod启动日志

```
1. william@jskill: ~/csdn/k8s-mse-in-action/ch05/10 (zsh)
2019-12-16 13:52:24.685 INFO 1 --- [main] com.zaxxer.hikari.HikariDataSource : HikariPool-1 - Starting...
2019-12-16 13:52:25.250 INFO 1 --- [main] com.zaxxer.hikari.HikariDataSource : HikariPool-1 - Start completed.
2019-12-16 13:52:26.099 INFO 1 --- [main] o.hibernate.jpa.internal.util.LogHelper : HHH000204: Processing PersistenceUnitInfo [name: default]
2019-12-16 13:52:26.197 INFO 1 --- [main] org.hibernate.Version : HHH000412: Hibernate Core {5.4.6.Final}
2019-12-16 13:52:26.389 INFO 1 --- [main] o.hibernate.annotations.common.Version : HCANN000001: Hibernate Commons Annotations {5.1.0.Final}
2019-12-16 13:52:26.545 INFO 1 --- [main] org.hibernate.dialect.Dialect : HHH000400: Using dialect: org.hibernate.dialect.MySQL57Dialect
2019-12-16 13:52:27.801 INFO 1 --- [main] o.h.e.t.j.p.i.JtaPlatformInitiator : HHH000490: Using JtaPlatform implementation: [org.hibernate.engine.transaction.jta.platform.internal.NoJtaPlatform]
2019-12-16 13:52:27.810 INFO 1 --- [main] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory for persistence unit 'default'
2019-12-16 13:52:28.639 WARN 1 --- [main] JpaBaseConfiguration$JpaWebConfiguration : spring.jpa.open-in-view is enabled by default. Therefore, database queries may be performed during view rendering. Explicitly configure spring.jpa.open-in-view to disable this warning
2019-12-16 13:52:28.824 INFO 1 --- [main] o.s.s.concurrent.ThreadPoolTaskExecutor : Initializing ExecutorService 'applicationTaskExecutor'
2019-12-16 13:52:29.960 INFO 1 --- [main] o.s.b.a.e.web.EndpointLinksResolver : Exposing 13 endpoint(s) beneath base path '/manage'
2019-12-16 13:52:30.030 INFO 1 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080 (http) with context path ''
2019-12-16 13:52:30.034 INFO 1 --- [main] c.s.s.petclinic.PetClinicApplication : Started PetClinicApplication in 8.541 seconds (JVM running for 9.147)
➔ 10 git:(master) ✕
```


校验PetClinic应用



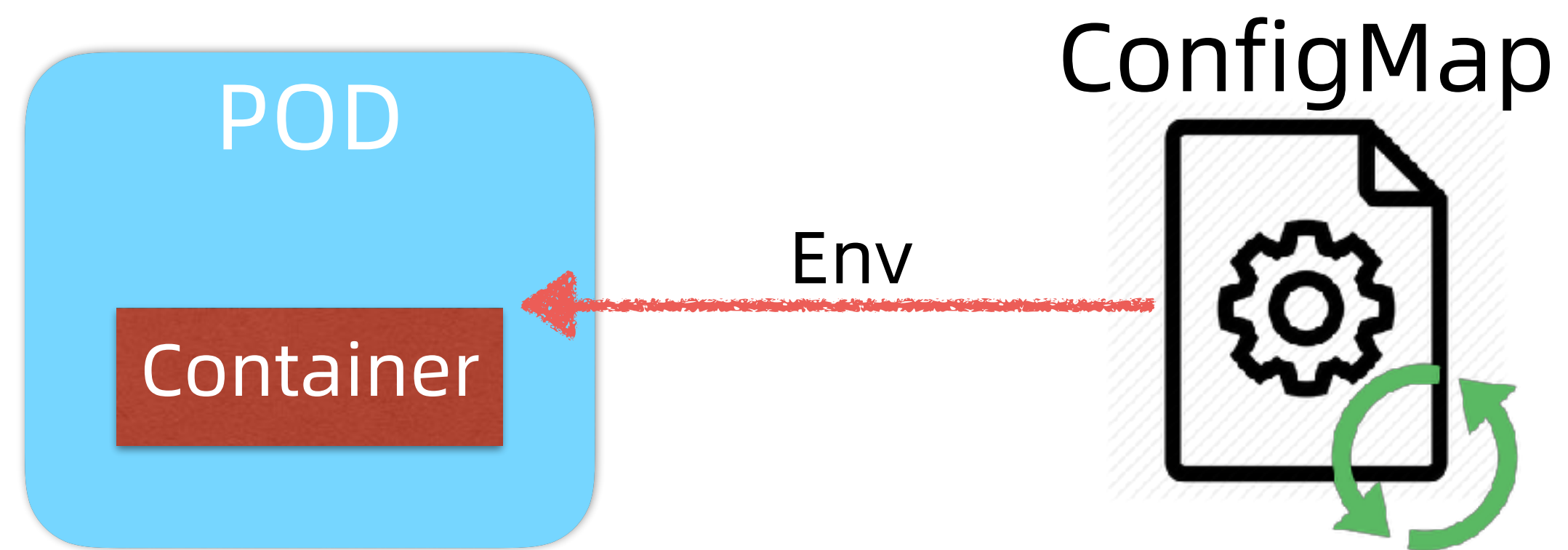
查询Petclinic Pod环境变量

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/10 (zsh)
→ 10 git:(master) x kubectl exec petclinic-56cdc78545-sf66d printenv

PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/lib/jvm/java-1.8-openjdk/jre/bin:/usr/lib/jvm/java-1.8-openjdk/bin
HOSTNAME=petclinic-56cdc78545-sf66d
DATASOURCE_PASSWORD=petclinic
DATASOURCE_URL=jdbc:mysql://mysql/petclinic
DATASOURCE_USERNAME=root
SPRING_PROFILES_ACTIVE=mysql
TEST_CONFIG=test_config_v1
DATASOURCE_INIT_MODE=always
PETCLINIC_PORT_8080_TCP_PROTO=tcp
PETCLINIC_PORT_8080_TCP_PORT=8080
KUBERNETES_SERVICE_PORT_HTTPS=443
MYSQL_SERVICE_HOST=10.106.26.100
MYSQL_SERVICE_PORT=3306
MYSQL_SERVICE_PORT_TCP=3306
PETCLINIC_SERVICE_PORT=8080
PETCLINIC_PORT_8080_TCP=tcp://10.97.51.228:8080
KUBERNETES_PORT_443_TCP=tcp://10.96.0.1:443
KUBERNETES_PORT_443_TCP_ADDR=10.96.0.1
MYSQL_PORT_3306_TCP_PROTO=tcp
PETCLINIC_SERVICE_PORT_HTTP=8080
KUBERNETES_SERVICE_HOST=10.96.0.1
KUBERNETES_SERVICE_PORT=443
KUBERNETES_PORT=tcp://10.96.0.1:443
MYSQL_PORT=tcp://10.106.26.100:3306
MYSQL_PORT_3306_TCP_ADDR=10.106.26.100
```

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/10 (zsh)
JAVA_ALPINE_VERSION=8.212.04-r0
HOME=/root
→ 10 git:(master) x kubectl exec petclinic-56cdc78545-sf66d printenv
| grep TEST_CONFIG
TEST_CONFIG=test_config_v1
→ 10 git:(master) x
```

ConfigMap变更传播



修改petclinic config

```
1  apiVersion: v1
2  kind: ConfigMap
3  metadata:
4    name: petclinic-config
5  data:
6    SPRING_PROFILES_ACTIVE: mysql
7    DATASOURCE_URL: jdbc:mysql://mysql/petclinic
8    DATASOURCE_USERNAME: root
9    DATASOURCE_PASSWORD: petclinic
10   DATASOURCE_INIT_MODE: always
11   TEST_CONFIG: test_config_v2
```

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/10 (zsh)
→ 10 git:(master) x clear
→ 10 git:(master) x kubectl apply -f petclinic-config.yml

configmap/petclinic-config configured
→ 10 git:(master) x kubectl exec petclinic-56cdc78545-sf66d printenv | g
rep TEST_CONFIG
TEST_CONFIG=test_config_v1
→ 10 git:(master) x
```

再次修改petclinic config和petclinic deployment

```
1 apiVersion: v1
2 kind: ConfigMap
3 metadata:
4   name: petclinic-config-v2
5 data:
6   SPRING_PROFILES_ACTIVE: mysql
7   DATASOURCE_URL: jdbc:mysql://mysql/petclinic
8   DATASOURCE_USERNAME: root
9   DATASOURCE_PASSWORD: petclinic
10  DATASOURCE_INIT_MODE: always
11  TEST_CONFIG: test_config_v2
```

```
1 apiVersion: apps/v1
2 kind: Deployment
3 metadata:
4   name: petclinic
5 spec:
6   selector:
7     matchLabels:
8       app: petclinic
9   replicas: 1
10  template:
11    metadata:
12      labels:
13        app: petclinic
14    spec:
15      containers:
16        - name: petclinic
17          image: spring2go/spring-petclinic:1.0.1.RELEASE
18          envFrom:
19            - configMapRef:
20              name: petclinic-config-v2
```


Petclinic Pod环境变量更新

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/10 (zsh)
→ 10 git:(master) x kubectl apply -f petclinic-config.yml
configmap/petclinic-config-v2 created
→ 10 git:(master) x kubectl apply -f petclinic-svc.yml
deployment.apps/petclinic configured
service/petclinic unchanged
→ 10 git:(master) x kubectl exec petclinic-56cdc78545-sf66d printenv | grep TEST_CONFIG
Error from server (NotFound): pods "petclinic-56cdc78545-sf66d" not found
→ 10 git:(master) x kubectl get all
NAME                                READY   STATUS    RESTARTS   AGE
pod/mysql                           1/1     Running   0           18m
pod/petclinic-6876dc8956-d2rlm      1/1     Running   0           27s

NAME                                TYPE                CLUSTER-IP      EXTERNAL-IP   PORT(S)          AGE
service/kubernetes                  ClusterIP           10.96.0.1       <none>        443/TCP          23m
service/mysql                       ClusterIP           10.106.26.100   <none>        3306/TCP          18m
service/petclinic                   NodePort            10.97.51.228    <none>        8080:31080/TCP   15m

NAME                                READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/petclinic            1/1     1             1           15m

NAME                                DESIRED   CURRENT   READY   AGE
replicaset.apps/petclinic-56cdc78545 0         0         0       15m
replicaset.apps/petclinic-6876dc8956 1         1         1       27s
→ 10 git:(master) x kubectl exec petclinic-6876dc8956-d2rlm printenv | grep TEST_CONFIG
TEST_CONFIG=test_config_v2
→ 10 git:(master) x
```


环境清理

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/10 (zsh)
→ 10 git:(master) x clear
→ 10 git:(master) x kubectl delete deploy --all
deployment.extensions "petclinic" deleted
→ 10 git:(master) x kubectl delete svc --all
service "kubernetes" deleted
service "mysql" deleted
service "petclinic" deleted
→ 10 git:(master) x kubectl delete po --all
pod "mysql" deleted
→ 10 git:(master) x kubectl delete cm --all
configmap "petclinic-config" deleted
configmap "petclinic-config-v2" deleted
→ 10 git:(master) x
```

本课小结



- ConfigMap是K8s提供的一种配置管理抽象，便于在微服务间共享配置。
- ConfigMap可以绑定到Pod的环境变量(Env)中，配置更新传播：
 - 需重启Pod
 - 建议更新ConfigMap的name和引用
- ConfigMap也可绑定到Pod的持久卷(Volume)，支持配置热更新