

第 7 节

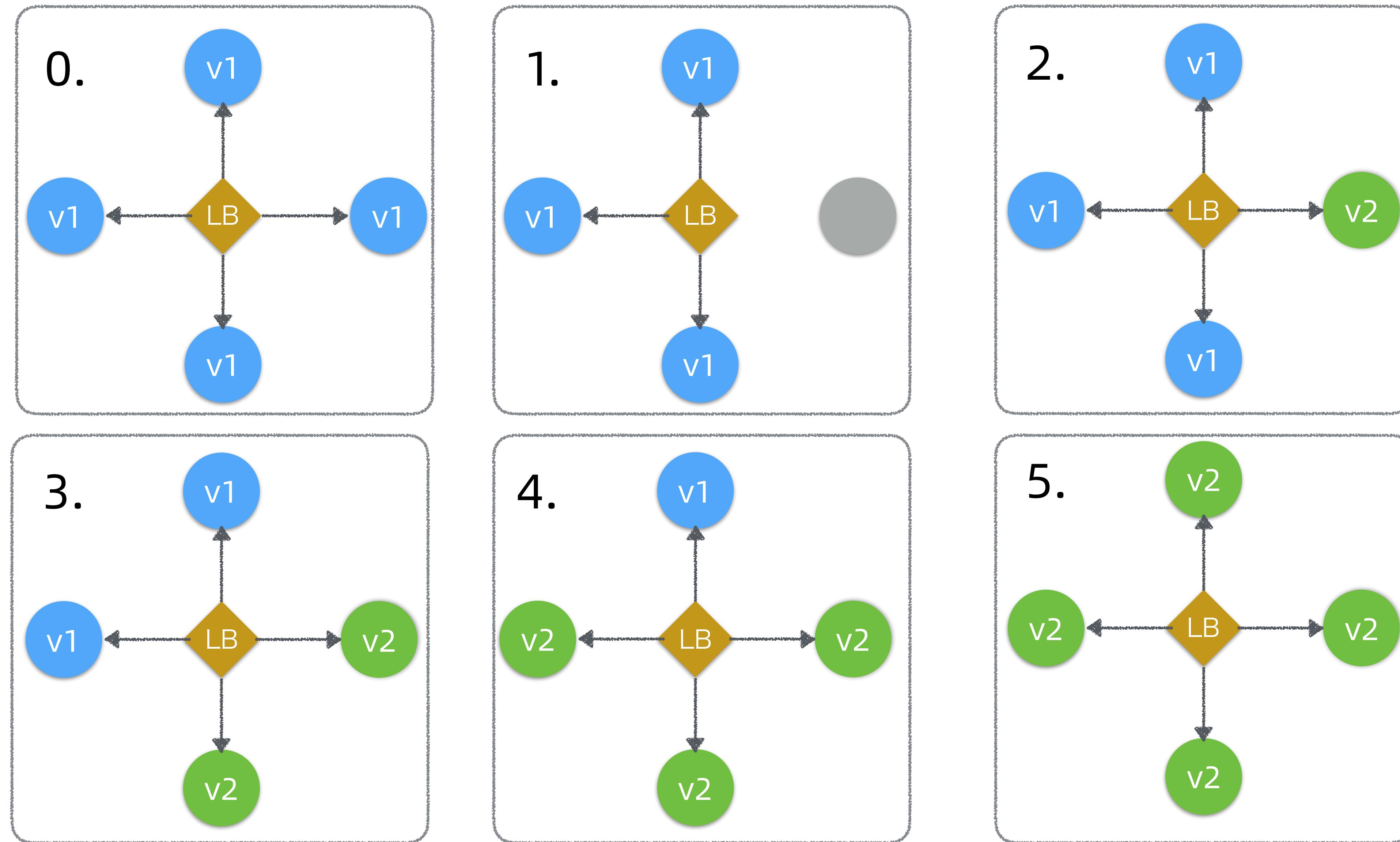
滚动发布抽象 ~ Deployment

本课内容

- 滚动发布(Rolling Update)原理
- K8s Deployment原理
- 使用Deployment实现Petclinic应用的滚动发布



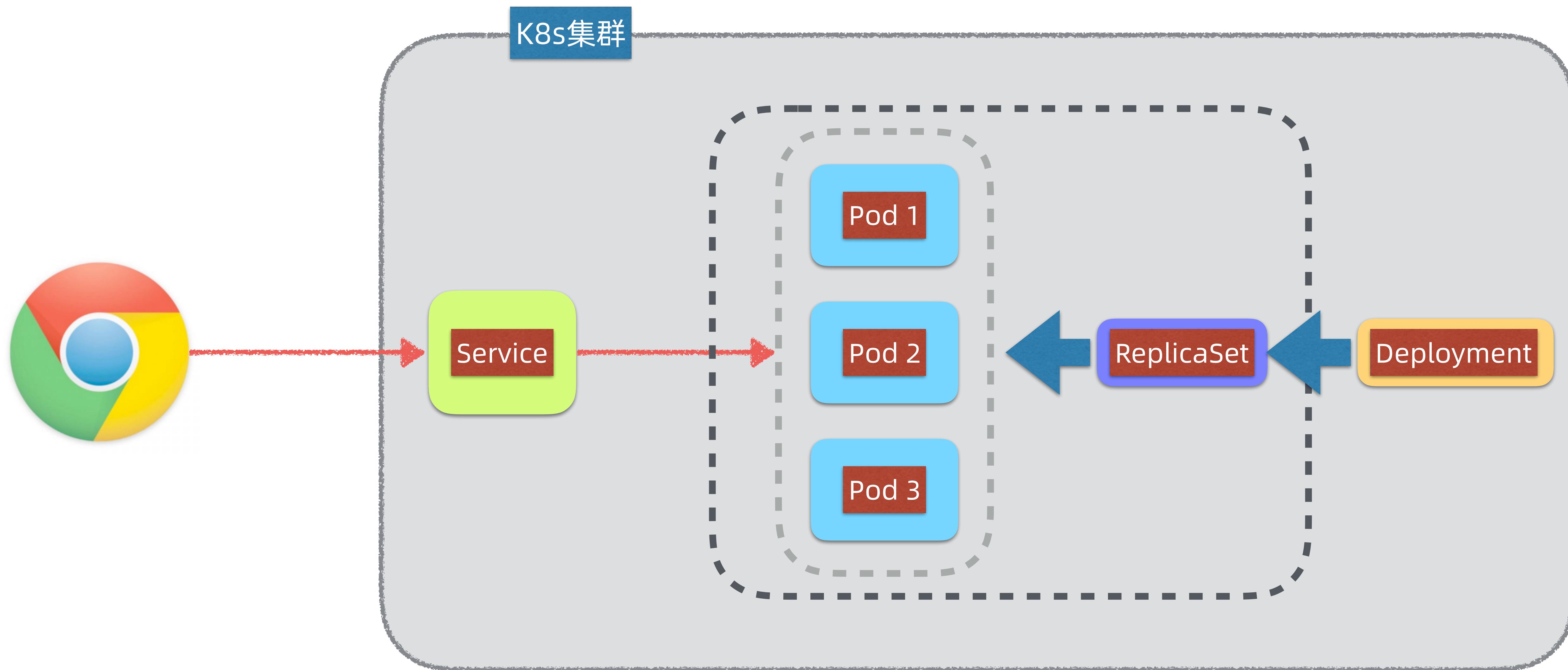
何谓滚动发布 Rolling Update



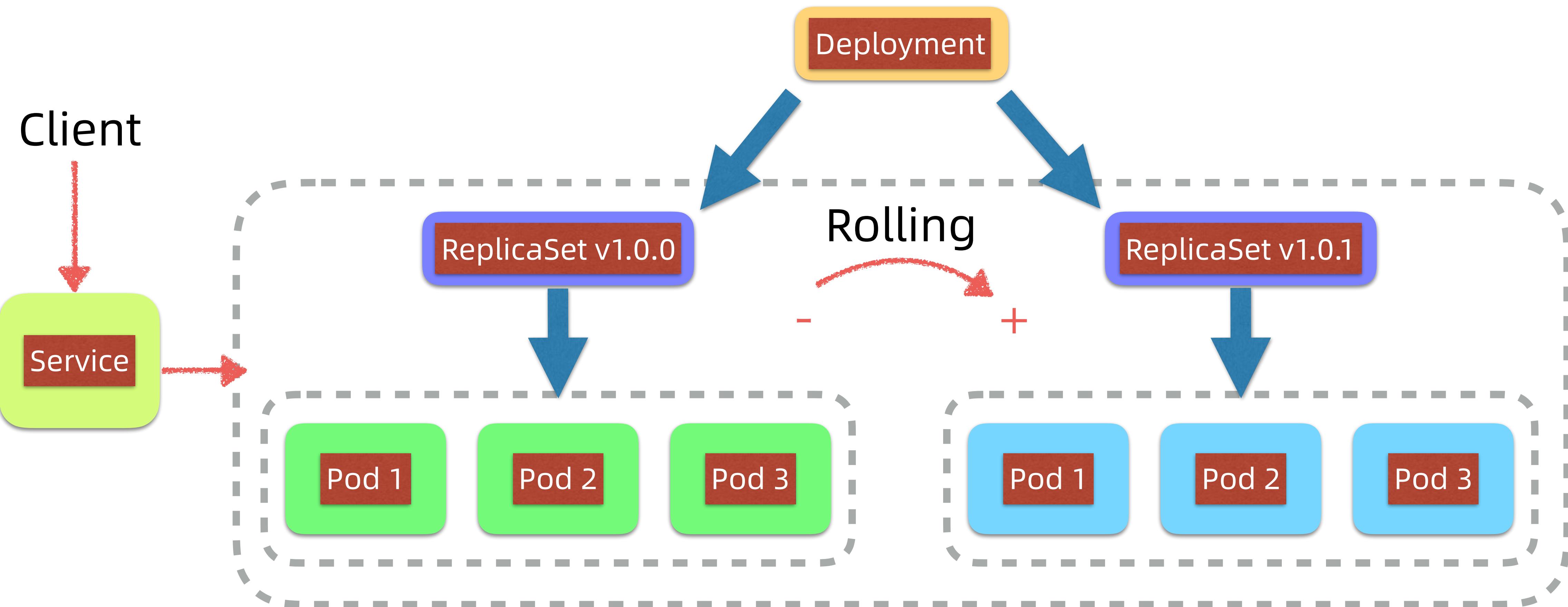
蓝绿 vs 滚动发布

	蓝绿	滚动
所需资源	两倍机器资源	无需额外或者少量
发布速度	很快	较慢
版本兼容性	支持版本不兼容升级	仅支持版本兼容升级
发布风险	风险大(需配合金丝雀)	风险小

K8s发布抽象Deployment



Deployment滚动发布



Deployment发布规范样例

Deployment v1 apps

kubectl example

curl example

Deployment Config to run 3 nginx instances (max rollback set to 10 revisions).

```
apiVersion: apps/v1
kind: Deployment
metadata:
  # Unique key of the Deployment instance
  name: deployment-example
spec:
  # 3 Pods should exist at all times.
  replicas: 3
  template:
    metadata:
      labels:
        # Apply this label to pods and default
        # the Deployment label selector to this value
        app: nginx
    spec:
      containers:
      - name: nginx
        # Run this image
        image: nginx:1.10
```

<https://kubernetes.io/docs/reference/generated/kubernetes-api/v1.14/#deployment-v1-apps>

PetClinic的Deployment发布规范

```
1 apiVersion: apps/v1
2 kind: Deployment
3 metadata:
4   name: petclinic
5 spec:
6   selector:
7     matchLabels:
8       app: petclinic
9     minReadySeconds: 10
10  replicas: 3
11  template:
12    metadata:
13      labels:
14        app: petclinic
15    spec:
16      containers:
17        - name: petclinic
18          image: spring2go/spring-petclinic:1.0.0.RELEASE
```

PetClinic的Service发布规范

```
1 apiVersion: v1
2 kind: Service
3 metadata:
4   name: petclinic
5 spec:
6   ports:
7     - name: http
8       port: 8080
9       targetPort: 8080
10      nodePort: 31080
11      selector:
12        app: petclinic
13      type: NodePort
```

发布PetClinic Deployment和Service

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/07 (zsh)
→ 07 git:(master) ✘ ls
petclinic-deployment.yml petclinic-service.yml
→ 07 git:(master) ✘ kubectl get all
NAME          TYPE    CLUSTER-IP      EXTERNAL-IP      PORT(S)      AGE
service/kubernetes   ClusterIP   10.96.0.1        <none>       443/TCP     38h
→ 07 git:(master) ✘ kubectl apply -f .
deployment.apps/petclinic created
service/petclinic created
→ 07 git:(master) ✘ kubectl get all
NAME          READY   STATUS    RESTARTS   AGE
pod/petclinic-548ddd5889-22zjs  1/1    Running   0          5s
pod/petclinic-548ddd5889-j7pvw  1/1    Running   0          5s
pod/petclinic-548ddd5889-r2gnk  1/1    Running   0          5s

NAME          TYPE    CLUSTER-IP      EXTERNAL-IP      PORT(S)      AGE
service/kubernetes   ClusterIP   10.96.0.1        <none>       443/TCP     38h
service/petclinic   NodePort    10.100.225.175  <none>      8080:31080/TCP  5s

NAME          READY   STATUS    RESTARTS   AGE
deployment.apps/petclinic  3/3    Ready     0          5s

NAME          DESIRED  CURRENT  READY   AGE
replicaset.apps/petclinic-548ddd5889  3        3      3      5s
→ 07 git:(master) ✘
```

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/07 (zsh)
service/kubernetes   ClusterIP   10.96.0.1        <none>       443/TCP     38h
service/petclinic   NodePort    10.100.225.175  <none>      8080:31080/TCP  5s

NAME          READY   UP-TO-DATE  AVAILABLE  AGE
deployment.apps/petclinic  3/3    3           0          5s

NAME          DESIRED  CURRENT  READY   AGE
replicaset.apps/petclinic-548ddd5889  3        3      3      5s

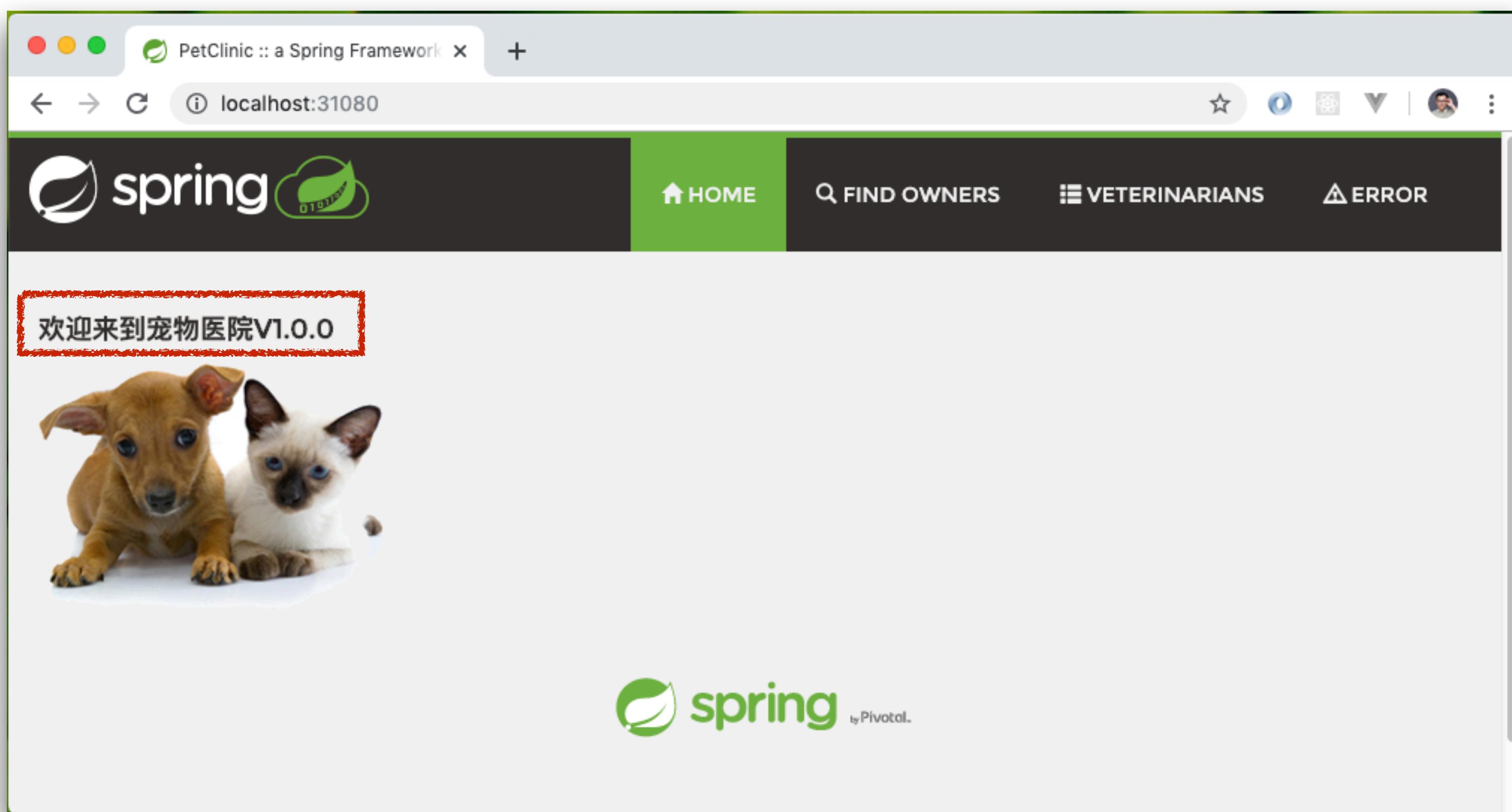
NAME          READY   STATUS    RESTARTS   AGE
pod/petclinic-548ddd5889-22zjs  1/1    Running   0          93s
pod/petclinic-548ddd5889-j7pvw  1/1    Running   0          93s
pod/petclinic-548ddd5889-r2gnk  1/1    Running   0          93s

NAME          TYPE    CLUSTER-IP      EXTERNAL-IP      PORT(S)      AGE
service/kubernetes   ClusterIP   10.96.0.1        <none>       443/TCP     38h
service/petclinic   NodePort    10.100.225.175  <none>      8080:31080/TCP  93s

NAME          READY   UP-TO-DATE  AVAILABLE  AGE
deployment.apps/petclinic  3/3    3           3          93s

NAME          DESIRED  CURRENT  READY   AGE
replicaset.apps/petclinic-548ddd5889  3        3      3      93s
→ 07 git:(master) ✘
```

校验PetClinic应用V1.0.0



更新PetClinic的Deployment发布规范

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

滚动发布PetClinic V1.0.1

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/07 (zsh)
→ 07 git:(master) ✘ kubectl apply -f .
deployment.apps/petclinic configured
service/petclinic unchanged
→ 07 git:(master) ✘ kubectl get all
NAME           READY   STATUS    RESTARTS   AGE
pod/petclinic-548ddd5889-22zjs  1/1     Running   0          5m38s
pod/petclinic-548ddd5889-j7pvw  1/1     Running   0          5m38s
pod/petclinic-548ddd5889-r2gnk  1/1     Running   0          5m38s
pod/petclinic-578c4688bd-78n7m  1/1     Running   0          3s

NAME            TYPE      CLUSTER-IP      EXTERNAL-IP      PORT(S)      AGE
service/kubernetes  ClusterIP  10.96.0.1      <none>        443/TCP      38h
service/petclinic  NodePort  10.100.225.175  <none>        8080:31080/TCP  5m38s

NAME           READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/petclinic  4/3      1           3          5m38s

NAME           DESIRED  CURRENT  READY   AGE
replicaset.apps/petclinic-548ddd5889  3        3        3      5m38s
replicaset.apps/petclinic-578c4688bd  1        1        1      3s
→ 07 git:(master) ✘ █
```

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/07 (zsh)
deployment.apps/petclinic  4/3   2           3           5m49s
NAME           DESIRED  CURRENT  READY   AGE
replicaset.apps/petclinic-548ddd5889  2        2        2      5m49s
replicaset.apps/petclinic-578c4688bd  2        2        2      14s
→ 07 git:(master) ✘ kubectl get all
NAME           READY   STATUS    RESTARTS   AGE
pod/petclinic-548ddd5889-22zjs  1/1     Running   0          5m51s
pod/petclinic-548ddd5889-j7pvw  1/1     Running   0          5m51s
pod/petclinic-548ddd5889-r2gnk  0/1     Terminating   0          5m51s
pod/petclinic-578c4688bd-78n7m  1/1     Running   0          16s
pod/petclinic-578c4688bd-lszmp  1/1     Running   0          4s

NAME            TYPE      CLUSTER-IP      EXTERNAL-IP      PORT(S)      AGE
service/kubernetes  ClusterIP  10.96.0.1      <none>        443/TCP      38h
service/petclinic  NodePort  10.100.225.175  <none>        8080:31080/TCP  5m51s

NAME           READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/petclinic  4/3      2           3          5m51s

NAME           DESIRED  CURRENT  READY   AGE
replicaset.apps/petclinic-548ddd5889  2        2        2      5m51s
replicaset.apps/petclinic-578c4688bd  2        2        2      16s
→ 07 git:(master) ✘ █
```

滚动发布结束

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/07 (zsh)

NAME          READY  UP-TO-DATE  AVAILABLE  AGE
deployment.apps/petclinic  4/3    2           3          5m51s

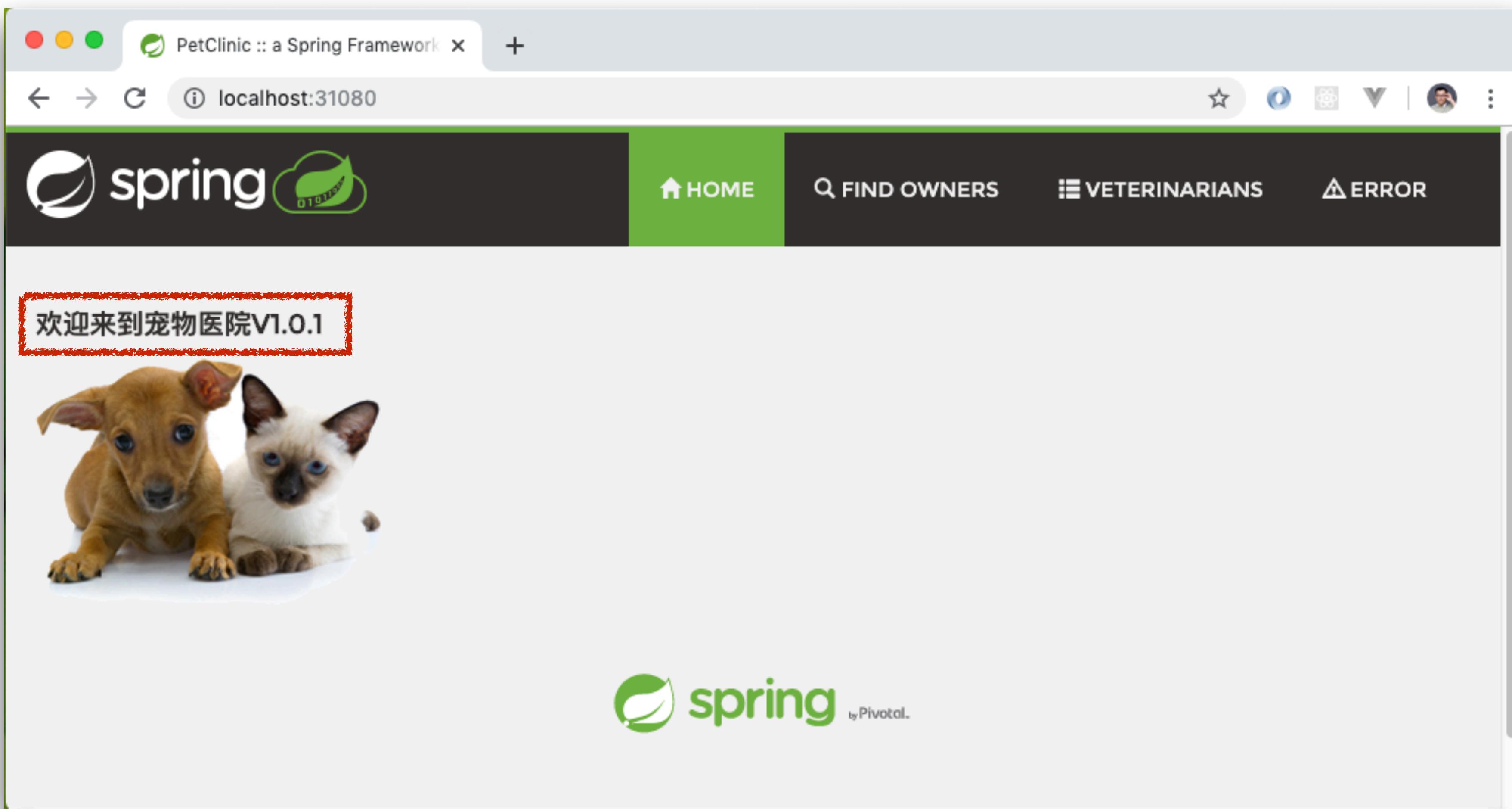
NAME          DESIRED  CURRENT  READY  AGE
replicaset.apps/petclinic-548ddd5889  2        2        2      5m51s
replicaset.apps/petclinic-578c4688bd  2        2        2      16s
→ 07 git:(master) ✘ kubectl get all
NAME          READY  STATUS  RESTARTS  AGE
pod/petclinic-578c4688bd-78n7m  1/1    Running  0          62s
pod/petclinic-578c4688bd-bclcc  1/1    Running  0          38s
pod/petclinic-578c4688bd-lszmp  1/1    Running  0          50s

NAME          TYPE      CLUSTER-IP      EXTERNAL-IP      PORT(S)      AGE
service/kubernetes  ClusterIP  10.96.0.1      <none>        443/TCP      38h
service/petclinic  NodePort   10.100.225.175  <none>        8080:31080/TCP  6m37s

NAME          READY  UP-TO-DATE  AVAILABLE  AGE
deployment.apps/petclinic  3/3    3           3          6m37s

NAME          DESIRED  CURRENT  READY  AGE
replicaset.apps/petclinic-548ddd5889  0        0        0      6m37s
replicaset.apps/petclinic-578c4688bd  3        3        3      62s
→ 07 git:(master) ✘
```

校验PetClinic应用V1.0.1



查看发布历史

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/07 (zsh)
→ 07 git:(master) ✘ kubectl rollout history deployment/petclinic
deployment.extensions/petclinic
REVISION  CHANGE-CAUSE
1          <none>
2          <none>

→ 07 git:(master) ✘
```

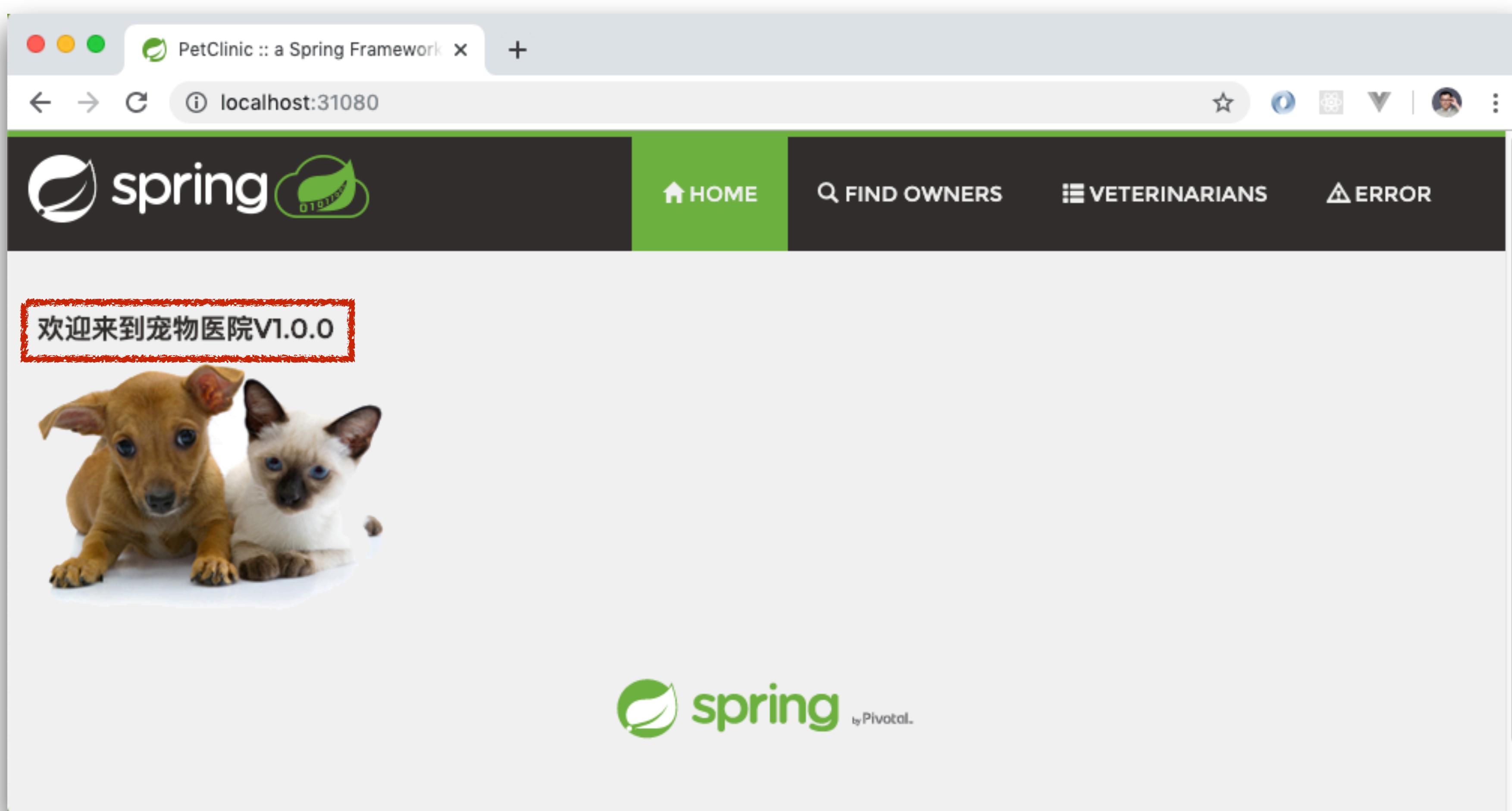
回滚发布

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/07 (zsh)
→ 07 git:(master) ✘ kubectl rollout history deployment/petclinic
deployment.extensions/petclinic
REVISION  CHANGE-CAUSE
1          <none>
2          <none>

→ 07 git:(master) ✘ kubectl rollout undo deployment/petclinic
deployment.extensions/petclinic rolled back
→ 07 git:(master) ✘ kubectl rollout status deployment/petclinic
Waiting for deployment "petclinic" rollout to finish: 1 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 1 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 1 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 2 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 2 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 2 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 2 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 1 old replicas are pending termination...
Waiting for deployment "petclinic" rollout to finish: 1 old replicas are pending termination...
Waiting for deployment "petclinic" rollout to finish: 1 old replicas are pending termination...
deployment "petclinic" successfully rolled out
→ 07 git:(master) ✘ kubectl rollout history deployment/petclinic
deployment.extensions/petclinic
REVISION  CHANGE-CAUSE
2          <none>
3          <none>

→ 07 git:(master) ✘
```

校验PetClinic应用回退到V1.0.0



指定回退版本

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/07 (zsh)
→ 07 git:(master) ✘ kubectl rollout history deployment/petclinic
deployment.extensions/petclinic
REVISION  CHANGE-CAUSE
2          <none>
3          <none>

→ 07 git:(master) ✘ kubectl rollout undo deployment/petclinic --to-revision=2
deployment.extensions/petclinic rolled back
→ 07 git:(master) ✘ kubectl rollout status deployment/petclinic
Waiting for deployment "petclinic" rollout to finish: 1 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 1 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 1 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 2 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 2 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 2 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 2 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 2 out of 3 new replicas have been updated...
Waiting for deployment "petclinic" rollout to finish: 1 old replicas are pending termination...
Waiting for deployment "petclinic" rollout to finish: 1 old replicas are pending termination...
Waiting for deployment "petclinic" rollout to finish: 1 old replicas are pending termination...
deployment "petclinic" successfully rolled out
→ 07 git:(master) ✘ kubectl rollout history deployment/petclinic
deployment.extensions/petclinic
REVISION  CHANGE-CAUSE
3          <none>
4          <none>

→ 07 git:(master) ✘
```

环境清理

```
1. william@jskill: ~/csdn/k8s-msa-in-action/ch05/07 (zsh)
→ 07 git:(master) ✘ kubectl get all
NAME                               READY   STATUS    RESTARTS   AGE
pod/petclinic-578c4688bd-6khx5   1/1     Running   0          94s
pod/petclinic-578c4688bd-hxwrx   1/1     Running   0          119s
pod/petclinic-578c4688bd-z957f   1/1     Running   0          106s

NAME             TYPE      CLUSTER-IP      EXTERNAL-IP      PORT(S)      AGE
service/kubernetes   ClusterIP   10.96.0.1      <none>        443/TCP      38h
service/petclinic   NodePort   10.100.225.175  <none>        8080:31080/TCP  15m

NAME           READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/petclinic   3/3       3           3           15m

NAME           DESIRED   CURRENT   READY   AGE
replicaset.apps/petclinic-548ddd5889  0          0          0          15m
replicaset.apps/petclinic-578c4688bd   3          3          3          10m
→ 07 git:(master) ✘ kubectl delete deploy petclinic
deployment.extensions "petclinic" deleted
→ 07 git:(master) ✘ kubectl delete svc petclinic
service "petclinic" deleted
→ 07 git:(master) ✘ kubectl get all
NAME                               READY   STATUS    RESTARTS   AGE
pod/petclinic-578c4688bd-6khx5   0/1     Terminating   0          115s
pod/petclinic-578c4688bd-hxwrx   0/1     Terminating   0          2m20s
pod/petclinic-578c4688bd-z957f   0/1     Terminating   0          2m7s

NAME             TYPE      CLUSTER-IP      EXTERNAL-IP      PORT(S)      AGE
service/kubernetes   ClusterIP   10.96.0.1      <none>        443/TCP      38h
→ 07 git:(master) ✘ kubectl get all
NAME             TYPE      CLUSTER-IP      EXTERNAL-IP      PORT(S)      AGE
service/kubernetes   ClusterIP   10.96.0.1      <none>        443/TCP      38h
→ 07 git:(master) ✘ █
```

本课小结



- 滚动发布是一种高级发布机制，支持按批次滚动发布，用户体验不中断，适用于**版本兼容发布**。蓝绿发布则适用于**版本不兼容发布**。
- K8s中的Deployment是对**RepcliaSet+滚动发布流程**的一种包装。
- 发布机制类似Replicaset
 - kind: Deployment
 - selector -> matchLabels