



Kubernetes Dashboard



前言

- 作为Kubernetes的Web用户界面，用户可以通过Dashboard在Kubernetes集群中部署容器化的应用，对应用进行问题处理和管理，并对集群本身进行管理。
- 通过Dashboard，用户可以查看集群中应用的运行情况，同时也能够创建或修改Kubernetes的资源。
- 通过部署向导，用户能够对部署的应用进行扩缩容、滚动更新、重启Pod，也可以部署新的应用。
- 当然，通过Dashboard也能够查看Kubernetes资源的状态。



目标

- 学完本课程后，您将能够：
 - 描述Dashboard的功能
 - 区分Dashboard不同的认证方式
 - 熟悉Dashboard界面结构
 - 熟练使用Dashboard管理Kubernetes集群
 - 熟练使用Dashboard部署应用



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1. Dashboard介绍

- Dashboard是什么
- Dashboard认证
- Dashboard界面结构

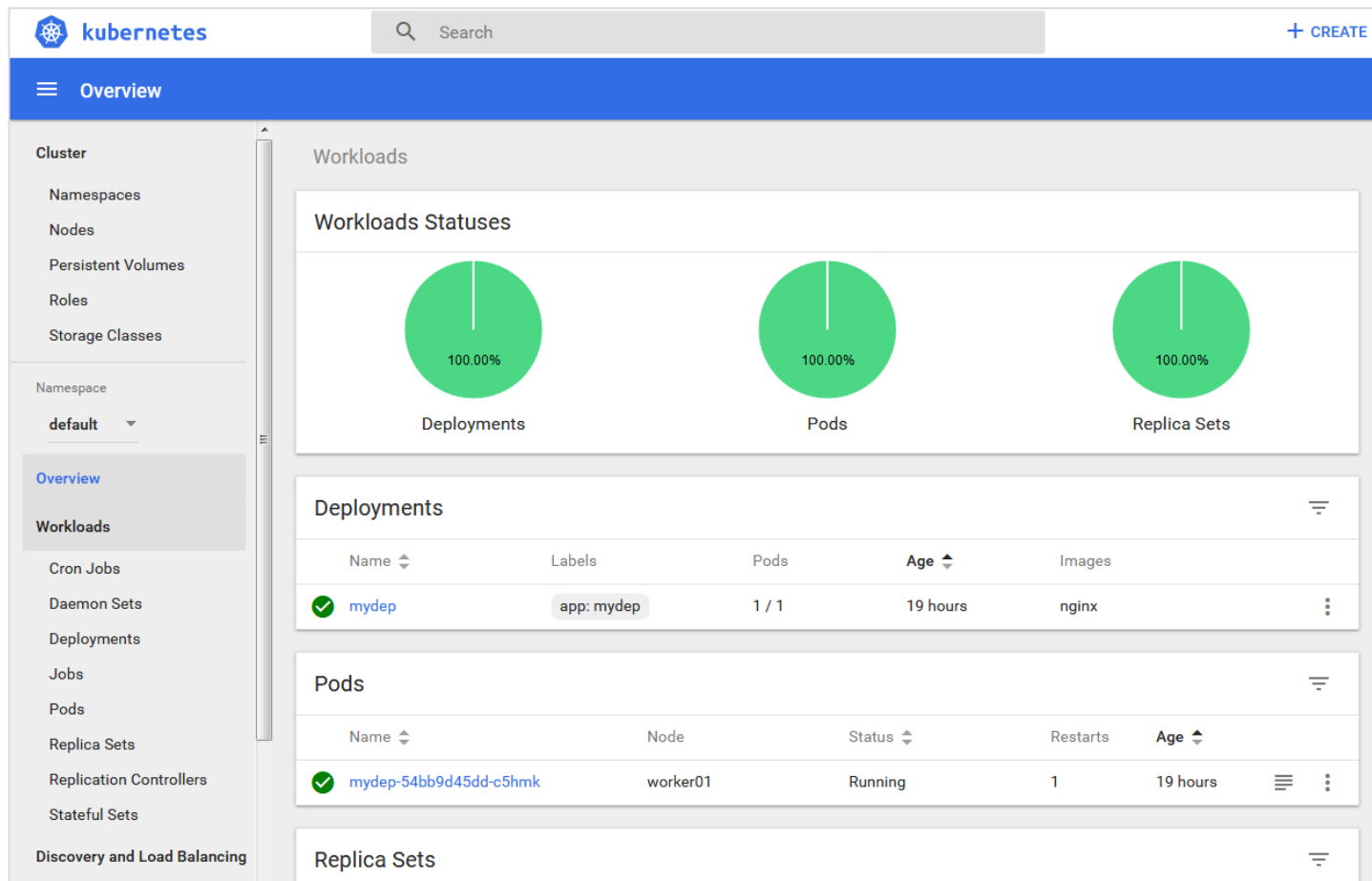
2. Dashboard功能

3. Dashboard部署应用



Dashboard是什么

- Dashboard是Kubernetes的用户网页接口，用于界面化管理Kubernetes集群。





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Dashboard认证 - 配置登录权限

- token方式认证
 - 创建serviceaccount, 根据其管理目标, 使用rolebinding或者clusterrolebinding 绑定至合理role或者clusterrole。
 - 获取到此serviceAccount的secret, 查看 secret的详细信息, 其中就有token, 粘贴到web界面的令牌里面。
- kubeconfig方式认证
 - 把serviceaccount的token封装为 kubeconfig文件。

The screenshot shows the 'Kubernetes Dashboard' login page. It features a blue header with the title 'Kubernetes Dashboard'. Below the header, the 'Authentication method:' section has two radio buttons: 'Kubeconfig' (selected) and 'Token'. Underneath, there is a text input field labeled 'Kubeconfig YAML file *' containing the text 'brand.kubeconfig'. To the right of the input field is a button with three dots. At the bottom, there are two buttons: 'SIGN IN' and 'SKIP'.



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Dashboard界面结构

- 顶部操作区（用户可以搜索集群中的资源、创建资源）



- 左边导航菜单（查看和管理集群中的各种资源）
 - Cluster级别资源
 - Namespace级别资源（默认显示的是default Namespace，可进行切换）
- 中间主体区（在导航菜单中点击了某类资源，中间主体区就会显示该资源的所有实例）



Dashboard界面介绍 - Cluster (1)

- 对于集群和命名空间管理员， Dashboard列出Nodes、Namespaces和持久化卷，并为其提供详细视图。

Cluster				
Namespaces				
Namespaces				
	Name ↕	Labels	Status	Age ↕
✓	default	-	Active	a day
✓	kube-node-lease	-	Active	a day
✓	kube-public	-	Active	a day
✓	kube-system	-	Active	a day



Dashboard界面介绍 - Cluster (2)



Dashboard界面介绍 - Cluster (3)

Cluster

Namespaces

Nodes

Persistent Volumes

Roles

Storage Classes

Namespace

default

Overview

Workloads

Cron Jobs

Daemon Sets

Deployments

Jobs

Pods

Replica Sets

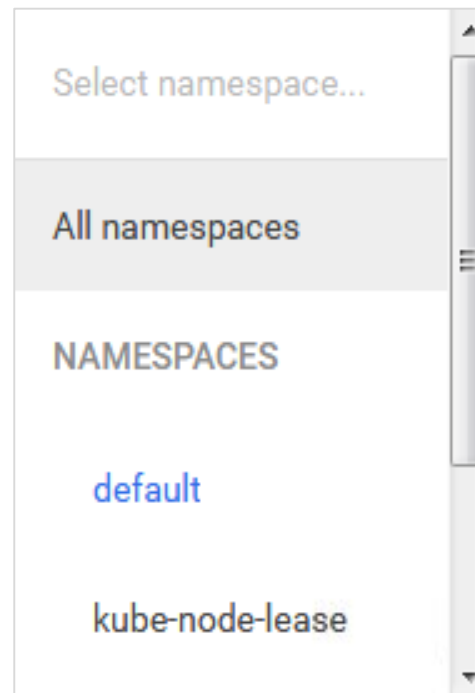
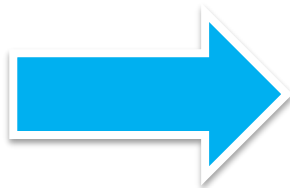
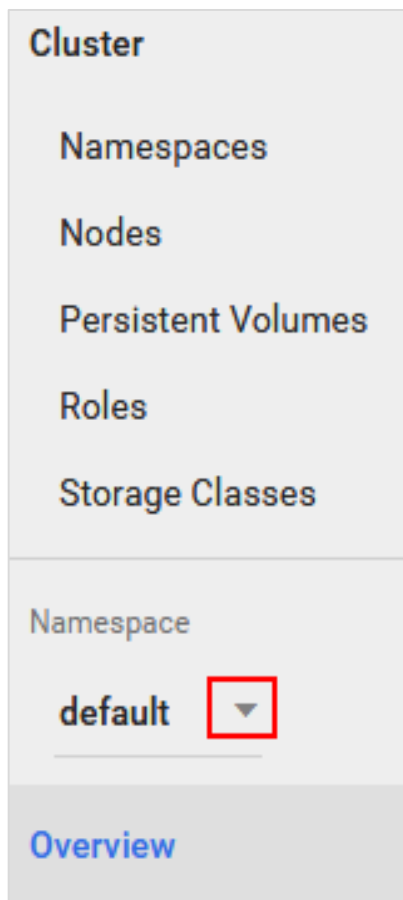
Roles			
Name	Role Type	Namespace	Age
kubernetes-dashboard-minimal	Role	kube-system	a day
flannel	Cluster Role	All Namespaces	a day
system:coredns	Cluster Role	All Namespaces	a day
kubeadm:bootstrap-signer-clusterinfo	Role	kube-public	a day
kube-proxy	Role	kube-system	a day
kubeadm:kubelet-config-1.15	Role	kube-system	a day
kubeadm:nodes-kubeadm-config	Role	kube-system	a day
system::leader-locking-kube-controller-r	Role	kube-system	a day
extension-apiserver-authentication-reac	Role	kube-system	a day
system:controller:bootstrap-signer	Role	kube-system	a day

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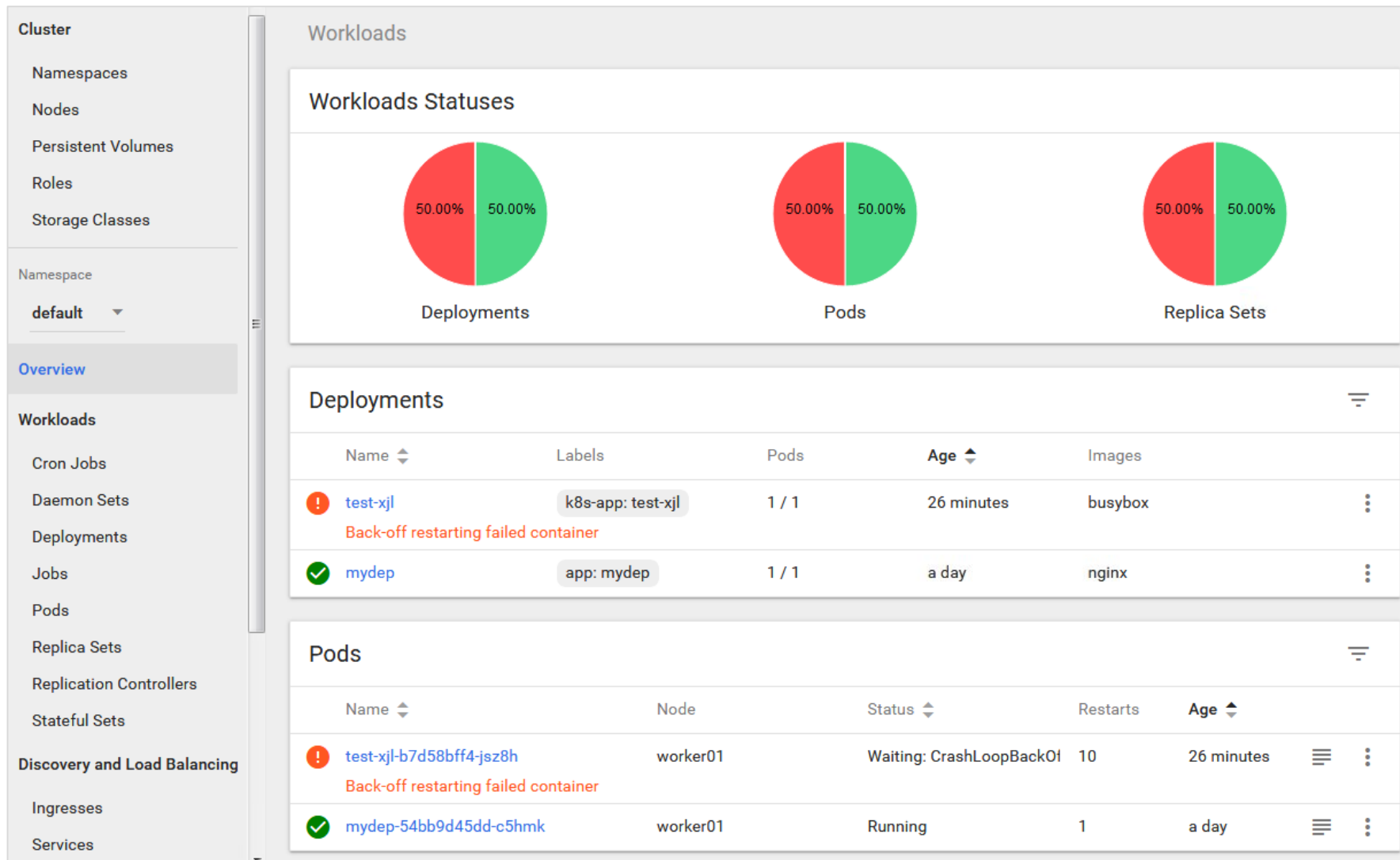
Dashboard界面介绍 - Namespace

- 选中不同Namespace，可以看到该Namespace下所有的资源情况。





Dashboard界面介绍 - Overview





Dashboard界面介绍 - Workloads (1)

- 显示所选 Namespace 中运行的所有 Workload 类型（如 Deployments、ReplicaSets等）的应用程序，并且每个Workload类型可以分开查看。

The screenshot shows the Kubernetes Dashboard interface for the 'default' namespace. The left sidebar contains a navigation menu with the following items: Overview, Workloads (selected), Cron Jobs, Daemon Sets, Deployments, Jobs, Pods, Replica Sets, Replication Controllers, Stateful Sets, Discovery and Load Balancing, Ingresses, Services, Config and Storage, Config Maps, Persistent Volume Claims, Secrets, and Settings.

The main content area displays three sections of Workloads:

Deployments

Name	Labels	Pods	Age	Images
test-xjl	k8s-app: test-xjl	1 / 1	36 minutes	busybox
Back-off restarting failed container				
mydep	app: mydep	1 / 1	a day	nginx

Pods

Name	Node	Status	Restarts	Age
test-xjl-b7d58bff4-jsz8h	worker01	Waiting: CrashLoopBackOff	12	36 minutes
Back-off restarting failed container				
mydep-54bb9d45dd-c5hmk	worker01	Running	1	a day

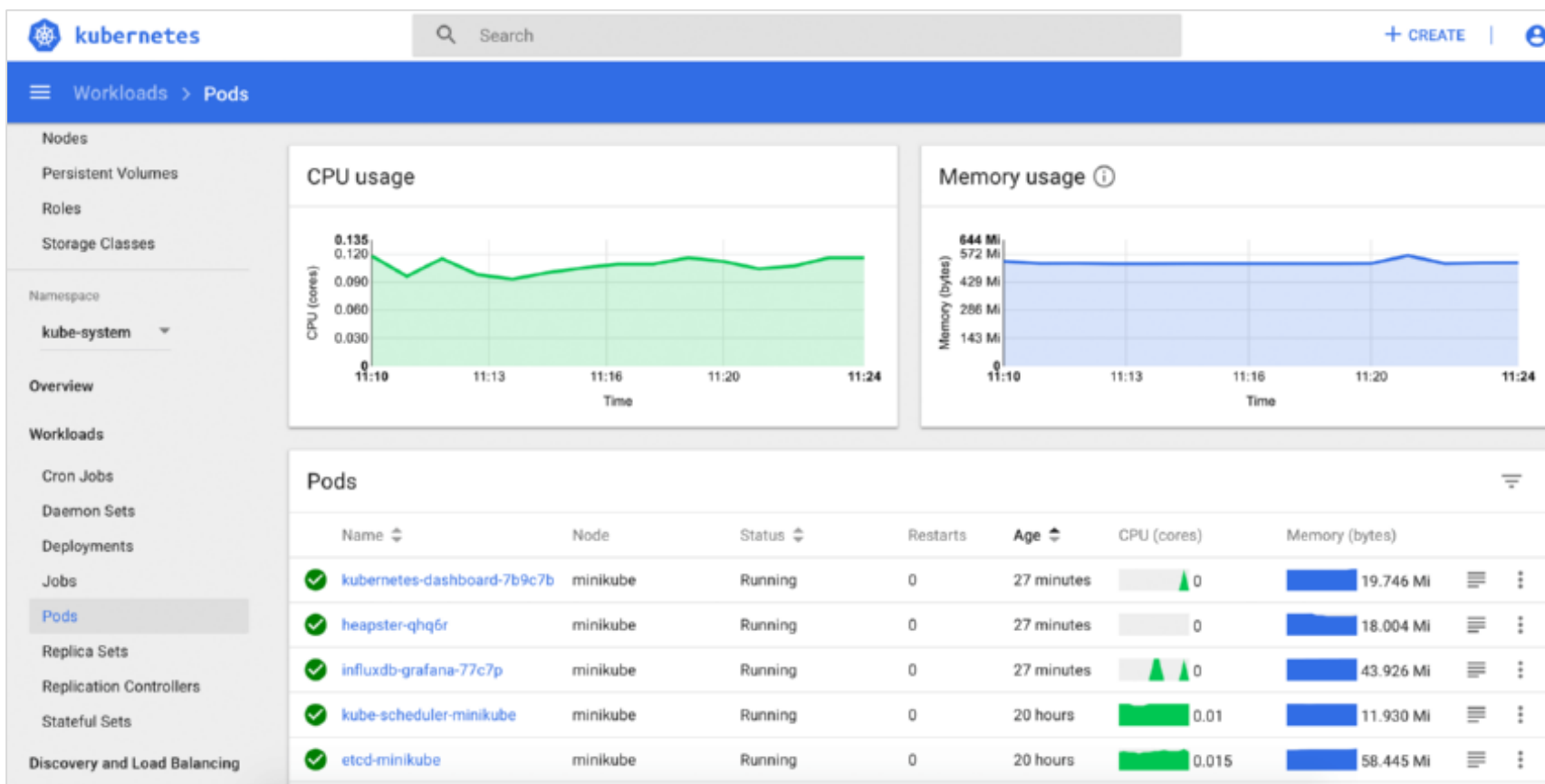
Replica Sets

Name	Labels	Pods	Age	Images
test-xjl-b7d58bff4	k8s-app: test-xjl pod-template-hash: b7d58bff4	1 / 1	36 minutes	busybox
Back-off restarting failed container				
mydep-54bb9d45dd	app: mydep pod-template-hash: 54bb9d45dd	1 / 1	a day	nginx



Dashboard界面介绍 - Workloads (2)

- 列表汇总了Workloads的可操作信息。例如，一个ReplicaSets的数量或一个Pod的当前内存使用率。





Dashboard界面介绍 - Workloads (3)

- Workloads的详细视图显示了对对象的状态、规格信息以及各个对象之间的关系。

The screenshot displays the Kubernetes Dashboard interface. On the left is a sidebar menu with categories: 'default' (selected), 'Overview', 'Workloads', 'Discovery and Load Balancing', and 'Config and Storage'. Under 'Workloads', 'Replica Sets' is highlighted. The main panel shows the 'Details' of a Deployment named 'mydep-54bb9d45dd' in the 'default' namespace. It lists labels ('app: mydep', 'pod-template-hash: 54bb9d45dd'), annotations ('deployment.kubernetes.io/desired-replicas: 1', 'deployment.kubernetes.io/max-replicas: 2', 'deployment.kubernetes.io/revision: 1'), creation time ('2019-06-27T06:46 UTC'), selector ('app: mydep', 'pod-template-hash: 54bb9d45dd'), and images ('nginx'). Below the details is a 'Pods' section with a table showing one running pod.

Name	Node	Status	Restarts	Age
mydep-54bb9d45dd-c5hmk	worker01	Running	1	a day



Dashboard界面介绍 - Discovery and Load Balancing

- Service和Ingress都归属于Discovery and Load Balancing列表下，显示用于集群连接的内部端点和外部用户的外部端点。

The screenshot shows the Kubernetes Dashboard interface. On the left is a sidebar with navigation links: Overview, Workloads (Cron Jobs, Daemon Sets, Deployments, Jobs, Pods, Replica Sets, Replication Controllers, Stateful Sets), and Discovery and Load Balancing (Ingresses, Services). The 'Services' link is selected. The main panel displays a table of Services.

Name	Labels	Cluster IP	Internal endpoints	External endpoints	Age
kubernetes	<code>component: apiserver</code> <code>provider: kubernet...</code>	10.96.0.1	kubernetes:443 TCP kubernetes:0 TCP	-	a day



Dashboard界面介绍 - Config and Storage

Config and storage

Namespace

default

Overview

Workloads

- Cron Jobs
- Daemon Sets
- Deployments
- Jobs
- Pods
- Replica Sets
- Replication Controllers
- Stateful Sets

Discovery and Load Balancing

- Ingresses
- Services

Config and Storage

- Config Maps
- Persistent Volume Claims
- Secrets

Secrets

Name	Type	Age
default-token-qqx7b	kubernetes.io/service-account-token	a day



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使用Dashboard能做什么 - 增

- 为Kubernetes集群部署容器化应用。

The screenshot shows the 'Resource creation' page in the Kubernetes Dashboard. The page has a blue header with the 'kubernetes' logo, a search bar, and a '+ CREATE' button. A left sidebar lists navigation options: Cluster, Namespaces, Nodes, Persistent Volumes, Roles, Storage Classes, Namespace (with a dropdown set to 'default'), Overview, Workloads, Cron Jobs, Daemon Sets, Deployments, and Jobs. The main content area has three tabs: 'CREATE FROM TEXT INPUT', 'CREATE FROM FILE', and 'CREATE AN APP' (which is selected). Below the tabs are four input fields: 'App name *' (with a character count '0 / 24'), 'Container image *', 'Number of pods *' (set to '1'), and 'Service *' (set to 'None'). Each field has a corresponding help text on the right. At the bottom, there is a 'SHOW ADVANCED OPTIONS' link and two buttons: 'DEPLOY' and 'CANCEL'.

Resource creation

Cluster

- Namespaces
- Nodes
- Persistent Volumes
- Roles
- Storage Classes

Namespace

default

Overview

Workloads

- Cron Jobs
- Daemon Sets
- Deployments
- Jobs

CREATE FROM TEXT INPUT CREATE FROM FILE **CREATE AN APP**

App name * 0 / 24

Container image *

Number of pods * 1

Service * None

An 'app' label with this value will be added to the Deployment and Service that get deployed. [Learn more](#)

Enter the URL of a public image on any registry, or a private image hosted on Docker Hub or Google Container Registry. [Learn more](#)

A Deployment will be created to maintain the desired number of pods across your cluster. [Learn more](#)

Optionally, an internal or external Service can be defined to map an incoming Port to a target Port seen by the container. [Learn more](#)

[SHOW ADVANCED OPTIONS](#)

DEPLOY CANCEL



使用Dashboard能做什么 - 删

- 对于不使用/有问题的应用进行删除，达到资源合理使用目的。

Deployments					
Name	Labels	Pods	Age	Images	
test-xjl	k8s-app: test-xjl	0 / 1	-	busybox	Scale
mydep	app: mydep	1 / 1	a day	nginx	Delete
Pods					View/edit YAML



Delete a Deployment

Are you sure you want to delete Deployment *test-xjl* in namespace *default*?

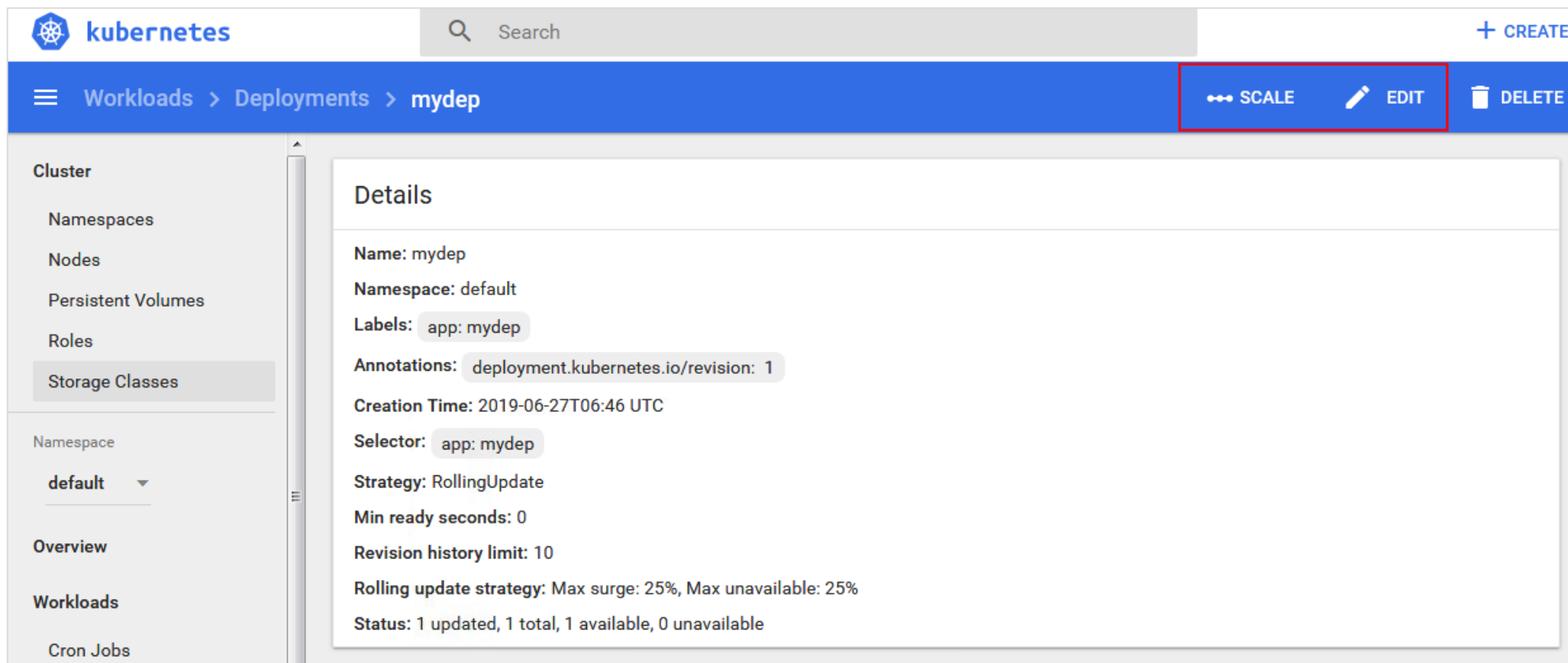
CANCEL

DELETE



使用Dashboard能做什么 - 改 (1)

- 修改Kubernetes集群资源 (Deployments、Jobs、DaemonSets等)





使用Dashboard能做什么 - 改 (2)

- 扩容或者缩容Pod数量

Scale a Deployment

Resource mydep will be updated to reflect the desired count.
Current status: 1 created, 1 desired.

Desired number of pods

1

[CANCEL](#) [OK](#)

- 编辑应用的yaml文件

Edit a Deployment

```
1 {
2   "kind": "Deployment",
3   "apiVersion": "extensions/v1beta1",
4   "metadata": {
5     "name": "mydep",
6     "namespace": "default",
7     "selfLink": "/apis/extensions/v1beta1/namespaces/default/deployments/mydep",
8     "uid": "44e4305f-e0ce-4abc-bb63-5ffea1fc0d4d",
9     "resourceVersion": "15973",
10    "generation": 1,
11    "creationTimestamp": "2019-06-27T06:46:00Z",
12    "labels": {
13      "app": "mydep"
14    },
15    "annotations": {
16      "deployment.kubernetes.io/revision": "1"
17    }
18  }
```

[CANCEL](#) [COPY](#) [UPDATE](#)



使用Dashboard能做什么 - 查 (1)

- 查看Kubernetes集群中容器化应用的信息。

The screenshot displays the Kubernetes Dashboard interface. The top navigation bar includes the 'kubernetes' logo, a search bar, and a '+ CREATE' button. The breadcrumb trail shows 'Workloads > Deployments > mydep'. On the right side of the breadcrumb, there are buttons for 'SCALE', 'EDIT', and 'DELETE'. The left sidebar contains a menu with categories: 'Cluster' (Namespaces, Nodes, Persistent Volumes, Roles, Storage Classes), 'Namespace' (default), 'Overview', 'Workloads' (Cron Jobs, Daemon Sets, Deployments, Jobs, Pods, Replica Sets), and 'Replica Sets'. The main content area is titled 'Details' and shows the following information for the 'mydep' deployment:

- Name: mydep
- Namespace: default
- Labels: app: mydep
- Annotations: deployment.kubernetes.io/revision: 1
- Creation Time: 2019-06-27T06:46 UTC
- Selector: app: mydep
- Strategy: RollingUpdate
- Min ready seconds: 0
- Revision history limit: 10
- Rolling update strategy: Max surge: 25%, Max unavailable: 25%
- Status: 1 updated, 1 total, 1 available, 0 unavailable

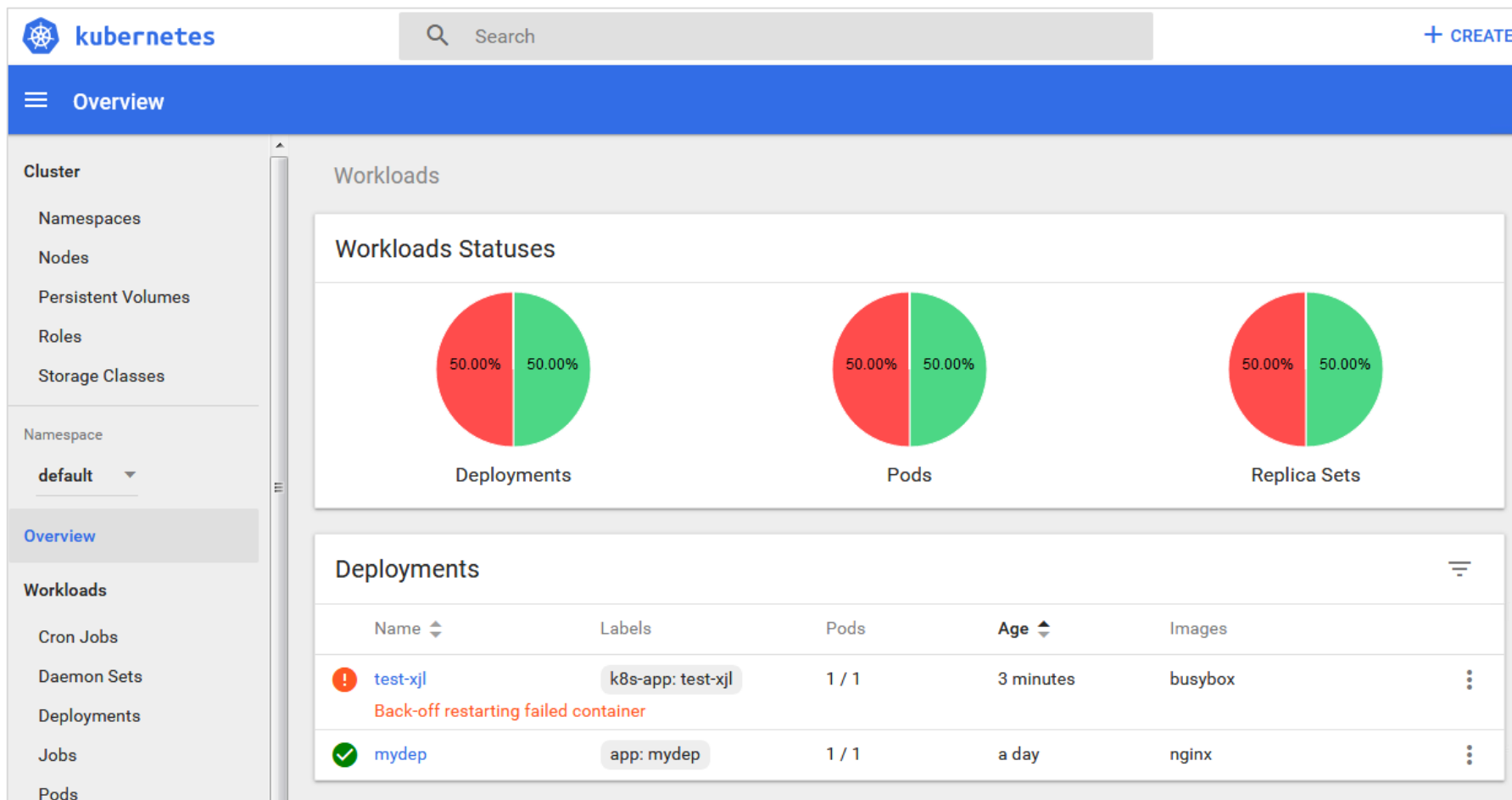
Below the details, there is a section titled 'New Replica Set' which contains a table with the following data:

Name	Labels	Pods	Age	Images
mydep-54bb9d45dd	app: mydep pod-template-hash: 54b...	1 / 1	19 hours	nginx



使用Dashboard能做什么 - 查 (2)

- 查看Kubernetes集群的资源状态。





使用Dashboard能做什么 - 查 (3)

- 通过Kubernetes集群容器化应用的日志进行故障排查。

The image displays two overlapping screenshots of the Kubernetes Dashboard. The top screenshot shows the 'Pod' details for 'mydep-54bb9d45dd-c5hmk' in the 'default' namespace. The 'EXEC', 'LOGS', 'EDIT', and 'DELETE' buttons are highlighted with a red box. The bottom screenshot shows the 'Logs' view for the same pod, displaying the logs for the 'nginx' container. The logs show the message: 'The selected container has not logged any messages yet.'

Kubernetes Dashboard - Pod Details

Cluster: mydep-54bb9d45dd-c5hmk
Namespace: default
Labels: app: mydep, pod-template-hash: 54bb9d45dd
Creation Time: 2019-06-27T06:46 UTC
Status: Running
QoS Class: BestEffort

Containers

nginx
Image: nginx
Environment variables: -
Commands: -
Args: -

Conditions

Kubernetes Dashboard - Logs

Logs from nginx in mydep-54bb9d45dd-c5hmk
The selected container has not logged any messages yet.

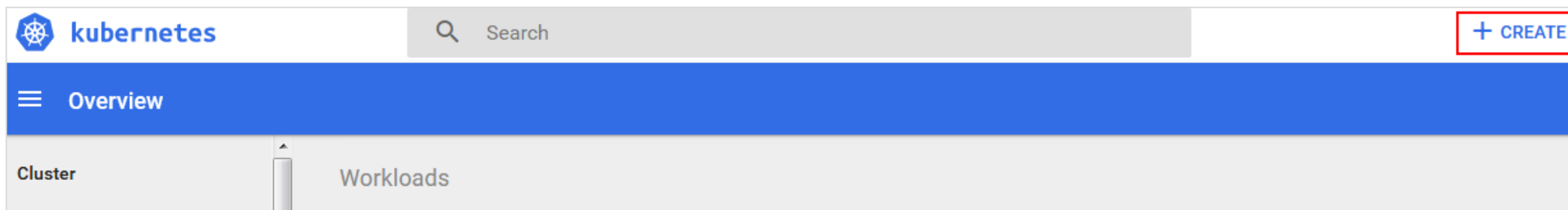


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使用Dashboard部署一个应用



- 部署应用的三种方式

- CREATE FORM TEXT INPUT
- CREATE FROM FILE
- CREATE AN APP

CREATE FROM TEXT INPUT CREATE FROM FILE **CREATE AN APP**

App name * 0 / 24 An 'app' label with this value will be added to the Deployment and Service that get deployed. [Learn more](#)

Container image * Enter the URL of a public image on any registry, or a private image hosted on Docker Hub or Google Container Registry. [Learn more](#)

Number of pods * A Deployment will be created to maintain the desired number of pods across your cluster. [Learn more](#)

Service * Optionally, an internal or external Service can be defined to map an incoming Port to a target Port seen by the container. [Learn more](#)

[SHOW ADVANCED OPTIONS](#)



使用Dashboard部署一个应用 - 必填项

CREATE FROM TEXT INPUT

CREATE FROM FILE

CREATE AN APP

App name *

0 / 24

Container image *

Number of pods *

1



使用Dashboard部署一个应用 - 选填项

Service *

Internal ☐

Port * Target port * Protocol * TCP ☐

Optionally, an internal or external Service can be defined to map an incoming Port to a target Port seen by the container. The internal DNS name for this Service will be: `textapp`. [Learn more](#)



None

Internal

External



TCP

UDP



使用Dashboard部署一个应用 - 高级选项

Description

Labels

Key	Value
k8s-app	textapp

7 / 253

Namespace *

default

Image Pull Secret

CPU requirement (cores)

Memory requirement (MiB)

Run command

Run command arguments

☐ Run as privileged

Environment variables

Name	Value
------	-------



实验任务

- 实验任务
 - 请按照实验手册的2.15章节完成Dashboard相关实验。



思考题

1. Dashboard通过 “CREATE AN APP” 方式部署应用时，以下哪些参数是必填项？（ ）
 - A. Services
 - B. App name
 - C. Container image
 - D. Number of pods
2. Dashboard可以显示Pods的CPU和内存使用率信息，无需安装配置额外组件。（ ）



本章总结

- 本章学习了以下内容：
 - Dashboard是什么
 - Dashboard的两种认证方式： token和Kubeconfig
 - Dashboard的界面架构和各个界面内容
 - Dashboard的功能： 增删改查
 - 如何使用Dashboard部署应用。

The background of the slide features a blue-tinted image of several business professionals in a modern office environment. They are standing on a highly reflective floor, and their silhouettes are clearly visible against the lighter background. The overall aesthetic is professional and corporate.

谢谢

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