

## 112Kubernetes 系列（一零五）Labels 和 annotations 用法

在 Kubernetes 中，您可以使用标签（Labels）将键值对配置到任何资源上。

标签无处不在，对于创建 Services 等日常运营对象来说是必需的。

但是，您应该如何命名和使用这些标签呢？

Kubernetes 中的任何资源都可以有标签。

有些标签至关重要（例如 Services 的 selector, operator 等），而其他标签对于标记资源很有用（例如标记部署）。

```
apiVersion: v1
kind: Service
metadata:
  name: my-service
spec:
  selector:
    app.kubernetes.io/name: myapp
  ports:
    - port: 80
```

points to the pod's label

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment
labels:
  app: nginx
spec:
  replicas: 3
```

not used by Kubernetes

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`kubectl` 提供了一个 `--show-labels` 标志来帮助您列出资源及其标签。

如果您在空集群中列出 Pod、Deployment 和 Service，您可能会注意到 Kubernetes 使用 `component=<name>` 标签来标记 Pod。

Kubernetes 为您的资源推荐了六个标签：

- Name
- Instance
- Version
- Component
- Part of

- Managed By

Key	Description	Example	Type
<code>app.kubernetes.io/name</code>	The name of the application	<code>mysql</code>	string
<code>app.kubernetes.io/instance</code>	A unique name identifying the instance of an application	<code>mysql-abcxyz</code>	string
<code>app.kubernetes.io/version</code>	The current version of the application (e.g., a <a href="#">SemVer 1.0</a> , revision hash, etc.)	<code>5.7.21</code>	string
<code>app.kubernetes.io/component</code>	The component within the architecture	<code>database</code>	string
<code>app.kubernetes.io/part-of</code>	The name of a higher level application this one is part of	<code>wordpress</code>	string
<code>app.kubernetes.io/managed-by</code>	The tool being used to manage the operation of an application	<code>helm</code>	string



让我们看一下使用这些标签的一个很好的例子：Prometheus Helm Chart(<https://github.com/prometheus-community/helm-charts>)。

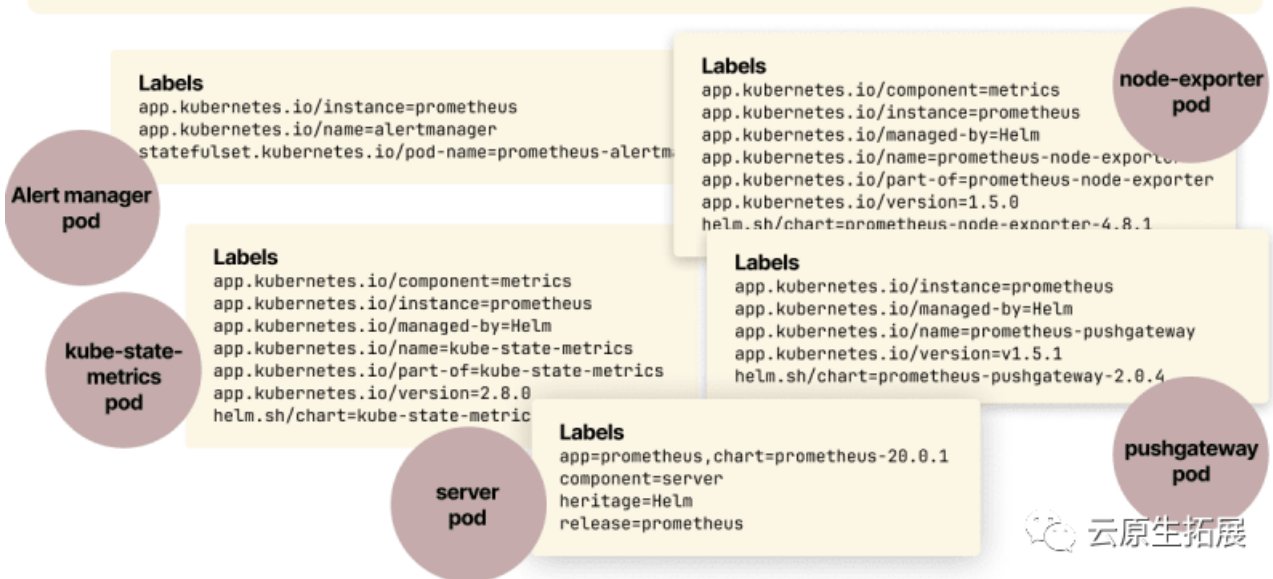
这些 Chart 安装了五个 pod（即 Server、alert manager、node exporter、push gateway 和 kube state metrics）。

请注意并非所有标签都应用于所有 Pod。



```
$ kubectl get pods --show-labels
```

NAME	LABELS
prometheus-alertmanager-0	app.kubernetes.io/instance=prometheus, app.kubernetes.io/name=prometheus-alertmanager, statefulset.kubernetes.io/pod-name=prometheus-alertmanager-0
prometheus-kube-state-metrics	app.kubernetes.io/component=metrics, app.kubernetes.io/instance=prometheus, app.kubernetes.io/managed-by=Helm, helm.sh/chart=kube-state-metrics-2.8.0
prometheus-prometheus-node-exporter	app.kubernetes.io/component=metrics, app.kubernetes.io/instance=prometheus, app.kubernetes.io/managed-by=Helm, helm.sh/chart=prometheus-node-exporter-4.8.1
prometheus-prometheus-pushgateway	app.kubernetes.io/instance=prometheus, app.kubernetes.io/managed-by=Helm, helm.sh/chart=prometheus-pushgateway-2.0.4
prometheus-server-849f5f4864	app=prometheus, chart=prometheus-20.0.1, component=server, heritage=Helm, release=prometheus



正确标记资源可以帮助您了解所部署的内容。

例如，您可以使用 `kubectl` 过滤结果：

```
kubectl get pods -l "environment in (staging, dev)"
```

上面的命令仅列出 `staging` 和 `dev` 中的 pod。

only showing pods in the staging or dev namespace

```
$ kubectl get pods -l "environment in (staging, dev)" --show-labels
```

NAME	LABELS
api-dev-787d4945fb-29s4x	environment=staging,app.kubernetes.io/name=api
api-staging-jvg4c	environment=dev,app.kubernetes.io/name=api
front-end-j4c	environment=dev,app.kubernetes.io/name=front-end
front-end-34u5iy	environment=staging,app.kubernetes.io/name=front-end
celery-staging-345ky	environment=staging,app.kubernetes.io/name=celery
celery-dev-sdfg98	environment=dev,app.kubernetes.io/name=celery
database-dev-xdfkj89	environment=dev,app.kubernetes.io/name=database

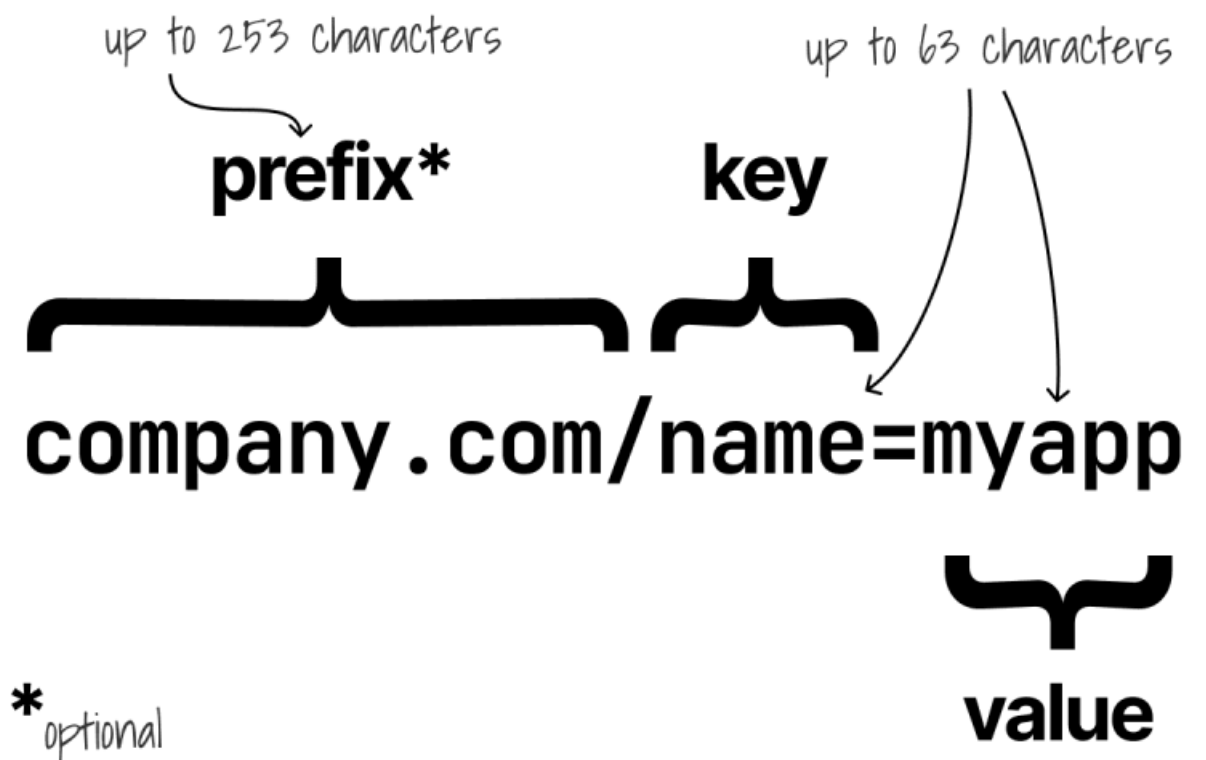
environment label

"app.kubernetes.io/name" label

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如果这些标签不是您想要的，您可以随时创建自己的标签。

建议使用 `<prefix>/<name>` 键 - 例如 `company.com/database`。



以下标签可以在多租户集群中使用：

- Business unit
- Development team
- Application
- Client
- Shared services
- Environment
- Compliance
- Asset classification

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx
  labels:
    sec.company.com/tenant-id: <tenant-uid>
    sec.company.com/environment: <dev|test|prod>
    sec.company.com/compliance: <compliance-req-uid>
spec:
  containers:
  - name: nginx
    image: nginx:1.14.2
    ports:
    - containerPort: 80
```

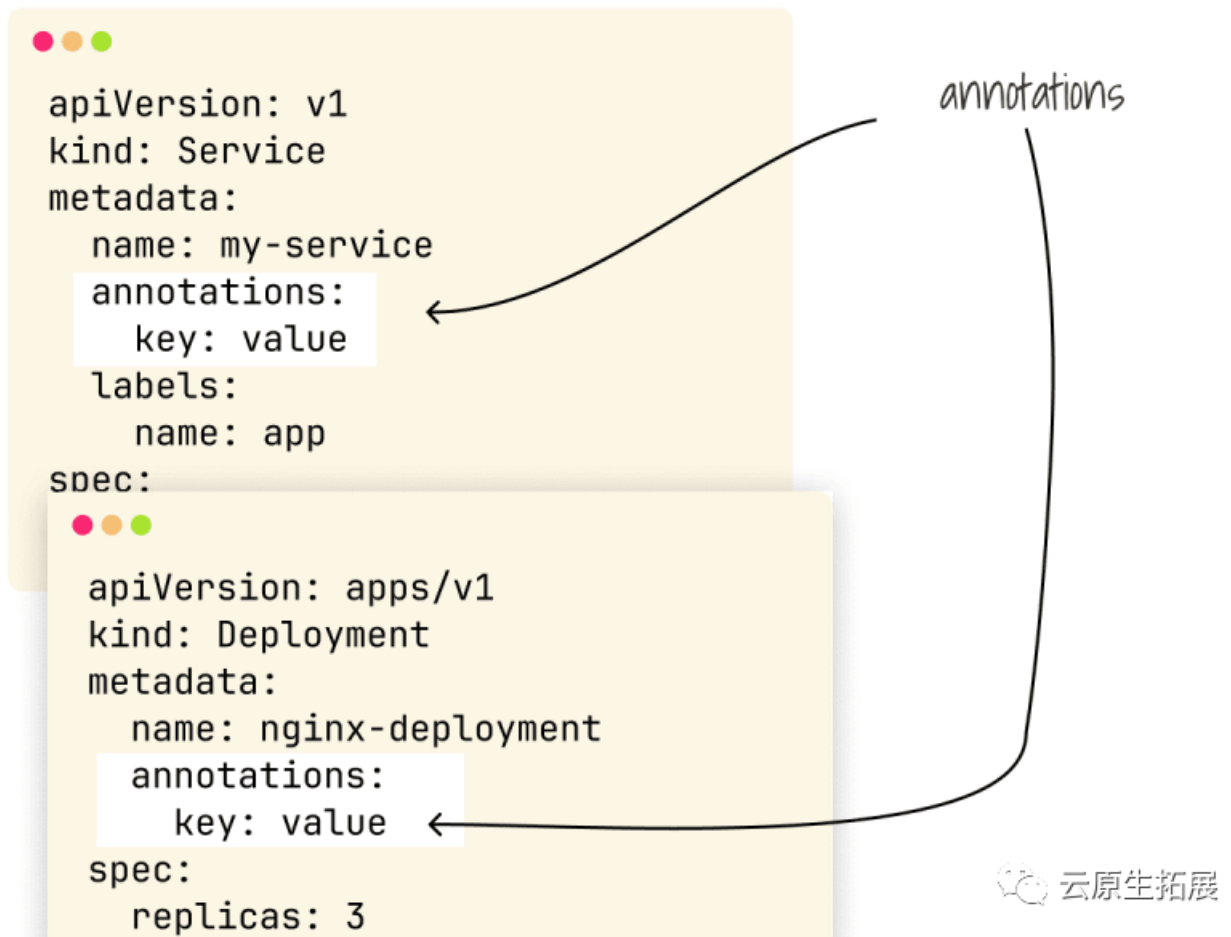
labels for multi-tenants clusters



除了标签之外，还有注释（annotation）。

标签用于选择资源，而注释则使用元数据来装饰资源。

您无法选择带注释的资源。



管理员可以为任何工作负载分配注释。

然而，更常见的是，Kubernetes 和 Operators 用额外的注释来装饰资源。

一个很好的例子是为 Pod 分配带宽的注释 `kubernetes.io/ingress-bandwidth`。

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx
spec:
  replicas: 1
  selector:
    matchLabels:
      app: nginx
  strategy:
    type: RollingUpdate
  template:
    metadata:
      labels:
        app: nginx
      annotations:
        # Ingress bandwidth
        kubernetes.io/ingress-bandwidth: 100M
        # Egress bandwidth
        kubernetes.io/egress-bandwidth: 1G
```

setting ingress  
and egress  
bandwidth



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官方文档有一个众所周知的标签和注释的列表(<https://kubernetes.io/docs/reference/labels-annotations-taints/>)。

这里有些例子：

- `kubectrl.kubernetes.io/default-container`
- `topology.kubernetes.io/region`
- `node.kubernetes.io/instance-type`
- `kubernetes.io/egress-bandwidth`

注释在 Operators 中广泛使用。

查看可与 ingress-nginx 控制器一起使用的所有注释（<https://github.com/kubernetes/ingress-nginx/blob/main/docs/user-guide/nginx-configuration/annotations.md>）。



Name			
nginx.ingress.kubernetes.io/app-root	nginx.ingress.kubernetes.io/client-body-buffer-size	nginx.ingress.kubernetes.io/proxy-next-upstream-tries	number
nginx.ingress.kubernetes.io/affinity	nginx.ingress.kubernetes.io/configuration-snippet	nginx.ingress.kubernetes.io/proxy-request-buffering	string
nginx.ingress.kubernetes.io/affinity-mode	nginx.ingress.kubernetes.io/custom-http-errors	nginx.ingress.kubernetes.io/proxy-redirect-from	string
nginx.ingress.kubernetes.io/affinity-canary-behavior	nginx.ingress.kubernetes.io/default-backend	nginx.ingress.kubernetes.io/proxy-redirect-to	string
nginx.ingress.kubernetes.io/auth-realm	nginx.ingress.kubernetes.io/enable-cors	nginx.ingress.kubernetes.io/proxy-http-version	"1.0" or "1.1"
nginx.ingress.kubernetes.io/auth-secret	nginx.ingress.kubernetes.io/cors-allow-origin	nginx.ingress.kubernetes.io/proxy-ssl-secret	string
nginx.ingress.kubernetes.io/auth-secret-type	nginx.ingress.kubernetes.io/cors-allow-methods	nginx.ingress.kubernetes.io/proxy-ssl-ciphers	string
nginx.ingress.kubernetes.io/auth-type	nginx.ingress.kubernetes.io/cors-allow-headers	nginx.ingress.kubernetes.io/proxy-ssl-name	string
nginx.ingress.kubernetes.io/auth-tls-secret	nginx.ingress.kubernetes.io/cors-expose-headers	nginx.ingress.kubernetes.io/proxy-ssl-protocols	string
nginx.ingress.kubernetes.io/auth-tls-verify-depth	nginx.ingress.kubernetes.io/cors-allow-credentials	nginx.ingress.kubernetes.io/proxy-ssl-verify	string
nginx.ingress.kubernetes.io/auth-tls-verify-client	nginx.ingress.kubernetes.io/cors-max-age	nginx.ingress.kubernetes.io/proxy-ssl-verify-depth	number
nginx.ingress.kubernetes.io/auth-tls-error-page	nginx.ingress.kubernetes.io/force-ssl-redirect	nginx.ingress.kubernetes.io/proxy-ssl-server-name	string
nginx.ingress.kubernetes.io/auth-tls-pass-certificate-headers	nginx.ingress.kubernetes.io/from-to-www-redirect	nginx.ingress.kubernetes.io/enable-rewrite-log	"true" or "false"
nginx.ingress.kubernetes.io/auth-tls-match-cn	nginx.ingress.kubernetes.io/http2-push-preload	nginx.ingress.kubernetes.io/rewrite-target	URI
nginx.ingress.kubernetes.io/auth-url	nginx.ingress.kubernetes.io/limit-connections	nginx.ingress.kubernetes.io/satisfy	string
nginx.ingress.kubernetes.io/auth-cache-key	nginx.ingress.kubernetes.io/limit-rps	nginx.ingress.kubernetes.io/server-alias	string
nginx.ingress.kubernetes.io/auth-cache-duration	nginx.ingress.kubernetes.io/global-rate-limit	nginx.ingress.kubernetes.io/server-snippet	string
nginx.ingress.kubernetes.io/auth-keepalive	nginx.ingress.kubernetes.io/global-rate-limit-key	nginx.ingress.kubernetes.io/service-upstream	"true" or "false"
nginx.ingress.kubernetes.io/auth-keepalive-requests	nginx.ingress.kubernetes.io/global-rate-limit-ignored-cidr	nginx.ingress.kubernetes.io/session-cookie-name	string
nginx.ingress.kubernetes.io/auth-keepalive-timeout	nginx.ingress.kubernetes.io/permanent-redirect	nginx.ingress.kubernetes.io/session-cookie-path	string
nginx.ingress.kubernetes.io/auth-proxy-set-headers	nginx.ingress.kubernetes.io/permanent-redirect-code	nginx.ingress.kubernetes.io/session-cookie-domain	string
nginx.ingress.kubernetes.io/auth-snippet	nginx.ingress.kubernetes.io/temporal-redirect	nginx.ingress.kubernetes.io/session-cookie-change-on-failure	"true" or "false"
nginx.ingress.kubernetes.io/enable-global-auth	nginx.ingress.kubernetes.io/preserve-trailing-slash	nginx.ingress.kubernetes.io/session-cookie-samesite	string
nginx.ingress.kubernetes.io/backend-protocol	nginx.ingress.kubernetes.io/proxy-body-size	nginx.ingress.kubernetes.io/session-cookie-conditional-samesite-none	"true" or "false"
nginx.ingress.kubernetes.io/canary	nginx.ingress.kubernetes.io/proxy-cookie-domain	nginx.ingress.kubernetes.io/ssl-redirect	"true" or "false"
nginx.ingress.kubernetes.io/canary-by-header	nginx.ingress.kubernetes.io/proxy-cookie-path	nginx.ingress.kubernetes.io/ssl-passthrough	"true" or "false"
nginx.ingress.kubernetes.io/canary-by-header-value	nginx.ingress.kubernetes.io/proxy-connect-timeout	nginx.ingress.kubernetes.io/stream-snippet	string
nginx.ingress.kubernetes.io/canary-by-header-pattern	nginx.ingress.kubernetes.io/proxy-send-timeout	nginx.ingress.kubernetes.io/upstream-hash-by	string
nginx.ingress.kubernetes.io/canary-by-cookie	nginx.ingress.kubernetes.io/proxy-read-timeout	nginx.ingress.kubernetes.io/x-forwarded-prefix	string
nginx.ingress.kubernetes.io/canary-weight	nginx.ingress.kubernetes.io/proxy-next-upstream	nginx.ingress.kubernetes.io/load-balance	string
nginx.ingress.kubernetes.io/canary-weight-total	nginx.ingress.kubernetes.io/proxy-next-upstream-timeout	nginx.ingress.kubernetes.io/upstream-vhost	string
		nginx.ingress.kubernetes.io/denylist-source-range	
		nginx.ingress.kubernetes.io/whitelist-source-range	



不幸的是，使用Operator/云提供商/等。如果您希望保持供应商中立，注释并不总是一个好主意。

但是，有时它也是唯一的选择（例如，在使用 LoadBalancer 类型的服务时，将 AWS ALB 部署在正确的子网中）。



```
apiVersion: v1
kind: Service
metadata:
  name: nlb-sample-service
  namespace: nlb-sample-app
  annotations:
    service.beta.kubernetes.io/aws-load-balancer-type: external
    service.beta.kubernetes.io/aws-load-balancer-nlb-target-type: ip
    service.beta.kubernetes.io/aws-load-balancer-scheme: internet-facing
spec:
  ports:
    - port: 80
      targetPort: 80
      protocol: TCP
  type: LoadBalancer
  selector:
    app: nginx
```



AWS EKS  
annotations for  
provisioning an  
NLB