



Kubernetes III Deep Dive

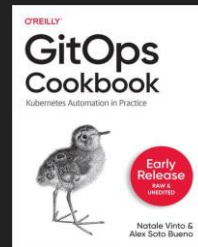
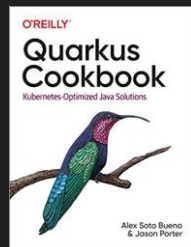
Homework dn.dev/kube-tutorial



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- Currently Red Hat's Director of Developer Experience
- Featured speaker at technology events around the globe
- A Java Champion since 2017
- Writer, University Professor, Radio collaborator
- A big fan of testing and continuous delivery in 21st century



Quick Recap

Kubernetes Deep Dive I & II

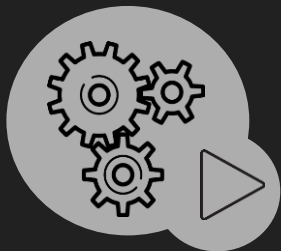
DevOps Challenges for Multiple Containers

- *How to scale?*
- *How to avoid port conflicts?*
- *How to manage them on multiple hosts?*
- *What happens if a host has trouble?*
- *How to keep them running?*
- *How to update them?*
- *Rebuild Container Images?*



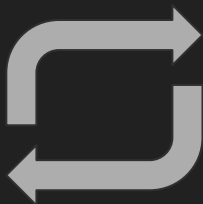
Kubernetes Terms

Pod



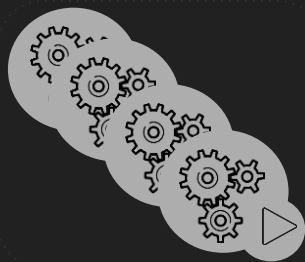
- ✓ 1+ containers
- ✓ Shared IP
- ✓ Shared storage (*ephemeral*)
- ✓ Shared resources
- ✓ Shared lifecycle

Replicaset/ Deployment



- ✓ The Desired State - replicas, pod template: health checks, resources, image

Service



- ✓ Grouping of pods (acting as one) has stable virtual IP and DNS name

Persistent Volume



- ✓ Network available storage
- ✓ PVs and PVCs

Label



- ✓ Key/Value pairs associated with Kubernetes objects (*env=production*)

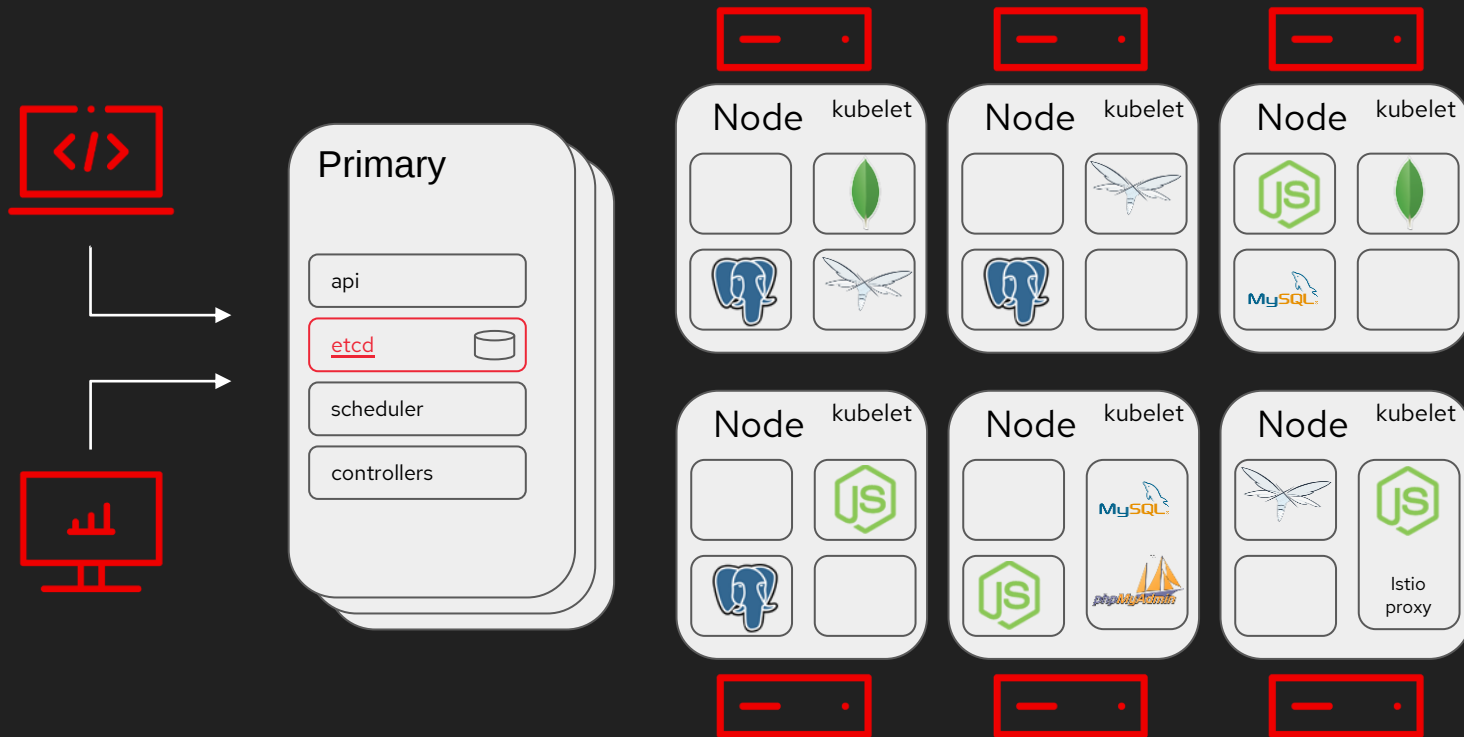
Secrets



Cambridge
Dictionary

Secret: a piece of information that is only known by one person or a few people and should not be told to others.

Kubernetes Cluster – Nodes

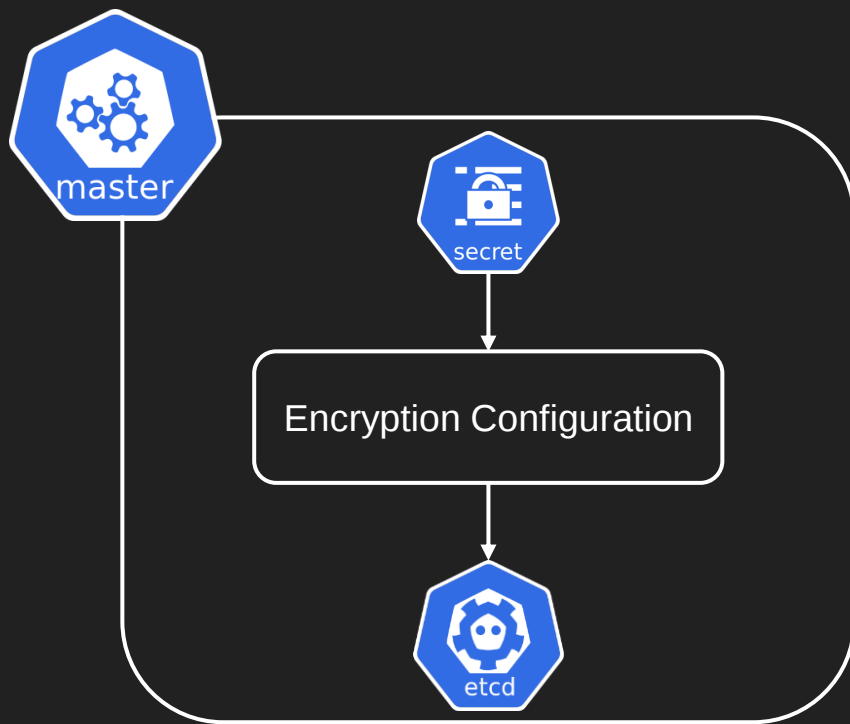




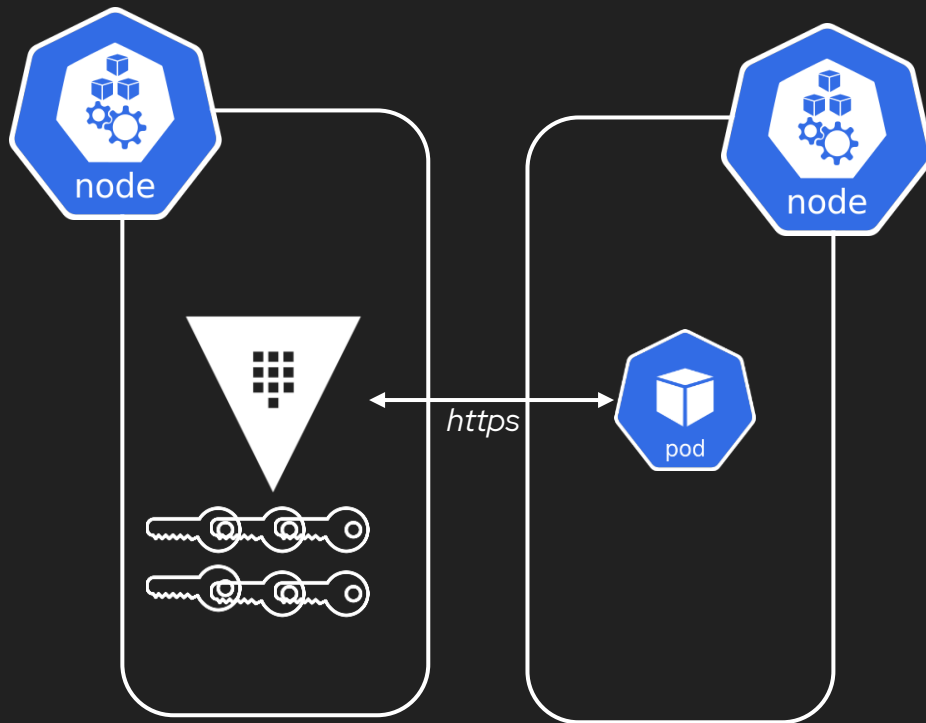
- *Kubernetes object that contains a small amount of sensitive data.*
- *Injected as volume or environment variable.*

All YAMLs and base64





Vaults provide full encryption



Volumes



*The data in volumes is preserved across container restarts.
Lifecycle tied to a pod.*



*Networked storage. Data is persisted beyond the lifetime of
a pod.*

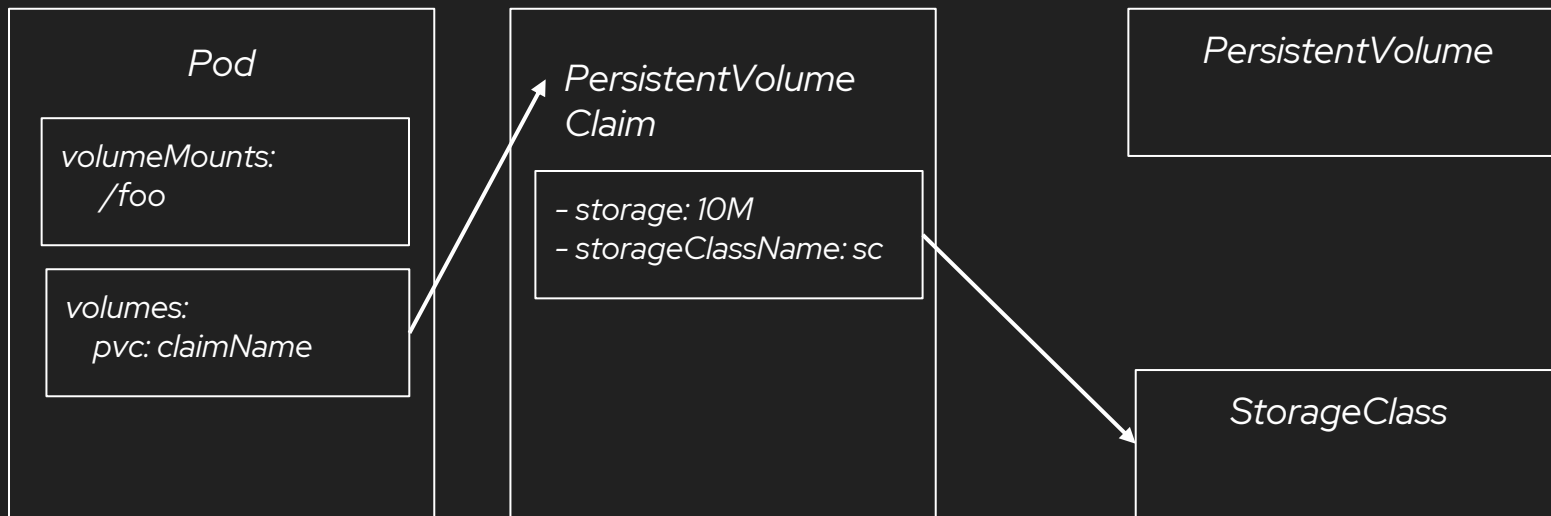


Storage needs to be claimed.



Storage Class for dynamic provisioning of storage.

<https://kubernetes.io/docs/concepts/storage/volumes/>



Taints & Affinity

Taints & Tolerances

Taint – applied to a Kubernetes Node that signals the scheduler to avoid or not schedule certain Pods.

Toleration – applied to a Pod definition and provides an exception to the taint.

Affinity & Anti-affinity

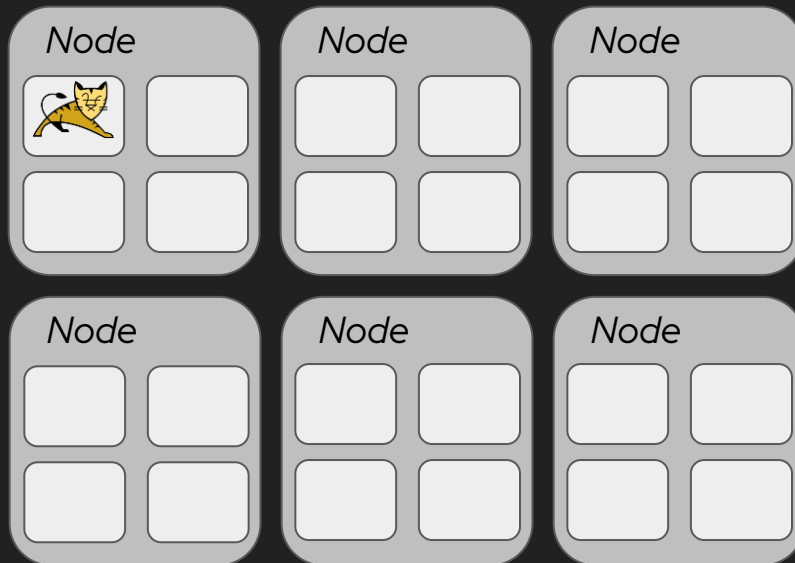
Node Affinity - rules that ban the node where pods can run, but also to favor where they should run

Pod Affinity - indicate a group of pods should always be deployed together on the same node (because of network communication, shared storage, etc.)

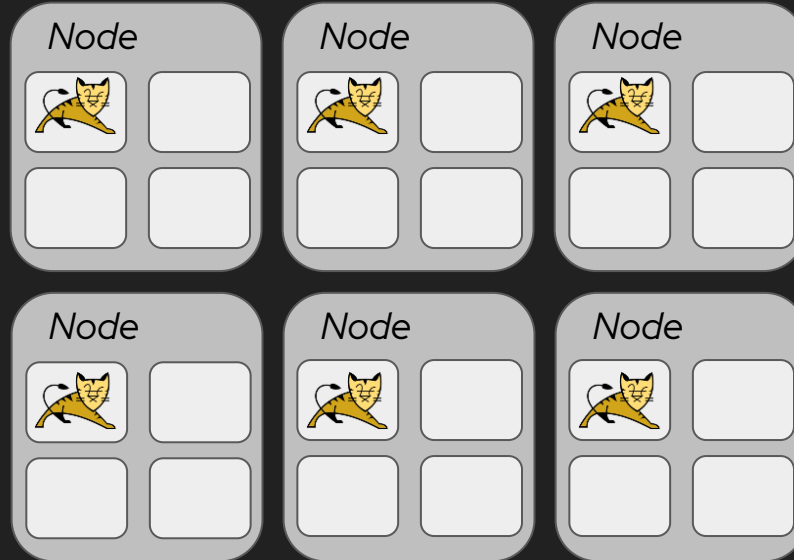
Jobs & CronJob

DaemonSets

Deployment



DaemonSet



StatefulSets

Additional Resources

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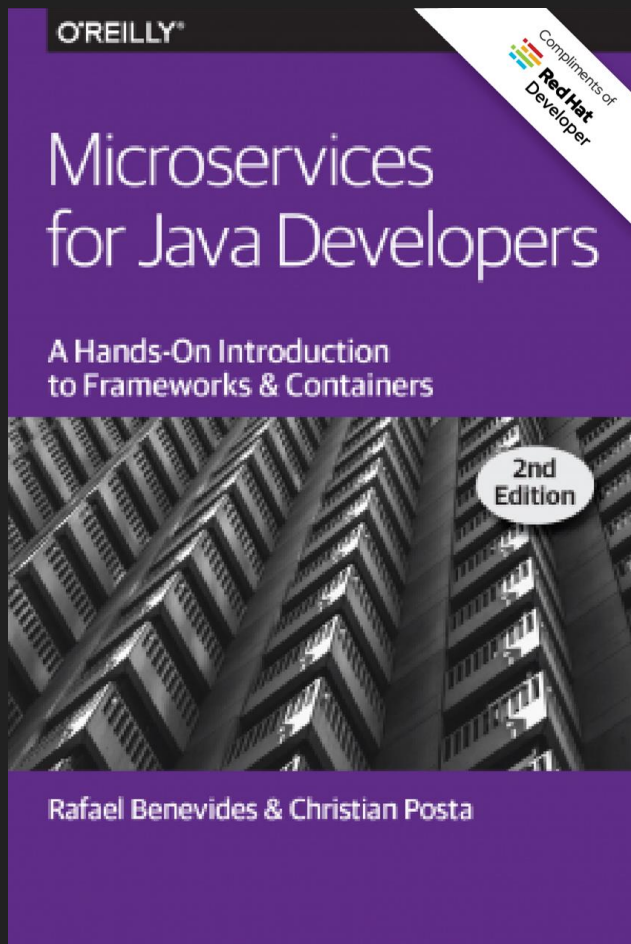
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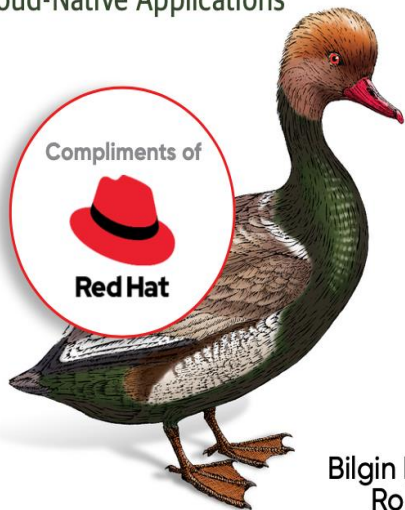
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Building Effective Serverless Applications
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Burr Sutter &
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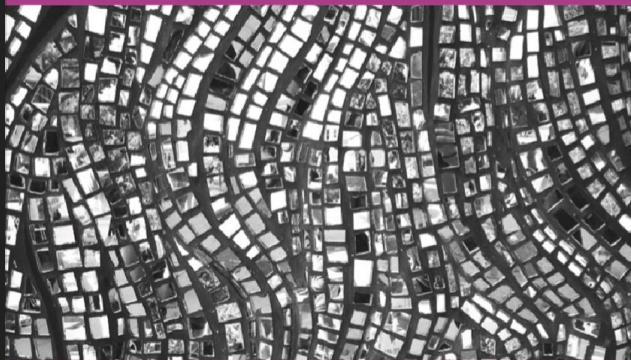
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Edson Yanaga

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- Setup
- Pipeline Resources
- Tasks
- ▼ Pipelines
 - Add Tasks from Catalog
 - Create Pipeline**
 - Deploy Pipeline
 - Run Pipeline
 - Test Pipeline
 - Clean
- Workspaces
- Private Registries and Repositories
- Triggers
- OpenShift Pipelines

Deploy Pipeline

The Kubernetes service deployment Pipeline could be created using the command

```
kubectl apply -n tektontutorial -f svc-deploy.yaml
```

We will use the Tekton cli to inspect the created resources

```
tkn pipeline ls
```

The above command should list one Pipeline as shown below:

NAME	AGE	LAST RUN	STARTED	DURATION
svc-deploy	4 seconds ago	---	---	---

TIP

Use the command **help** via `tkn pipeline --help` to see more options

Run Pipeline

dn.dev/master

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