

Kubernetes Storage In Action

Sheng Yang
Rancher Labs



- Feb 18th, 2020



Sheng Yang

Software Architect @Rancher_Labs

 /  /  : @yasker
sheng.yang@rancher.com

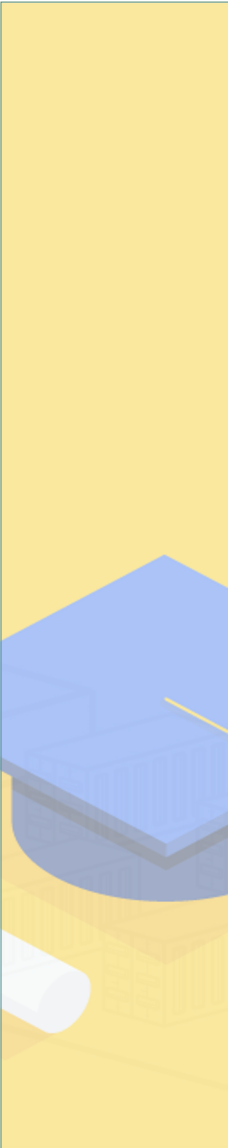
Agenda

- Persistent storage concepts in Kubernetes
 - RWO vs RWX, Deployment vs StatefulSet
- Storage In Action

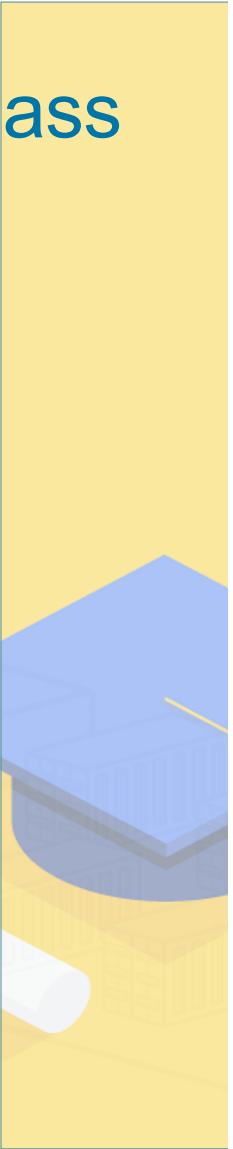
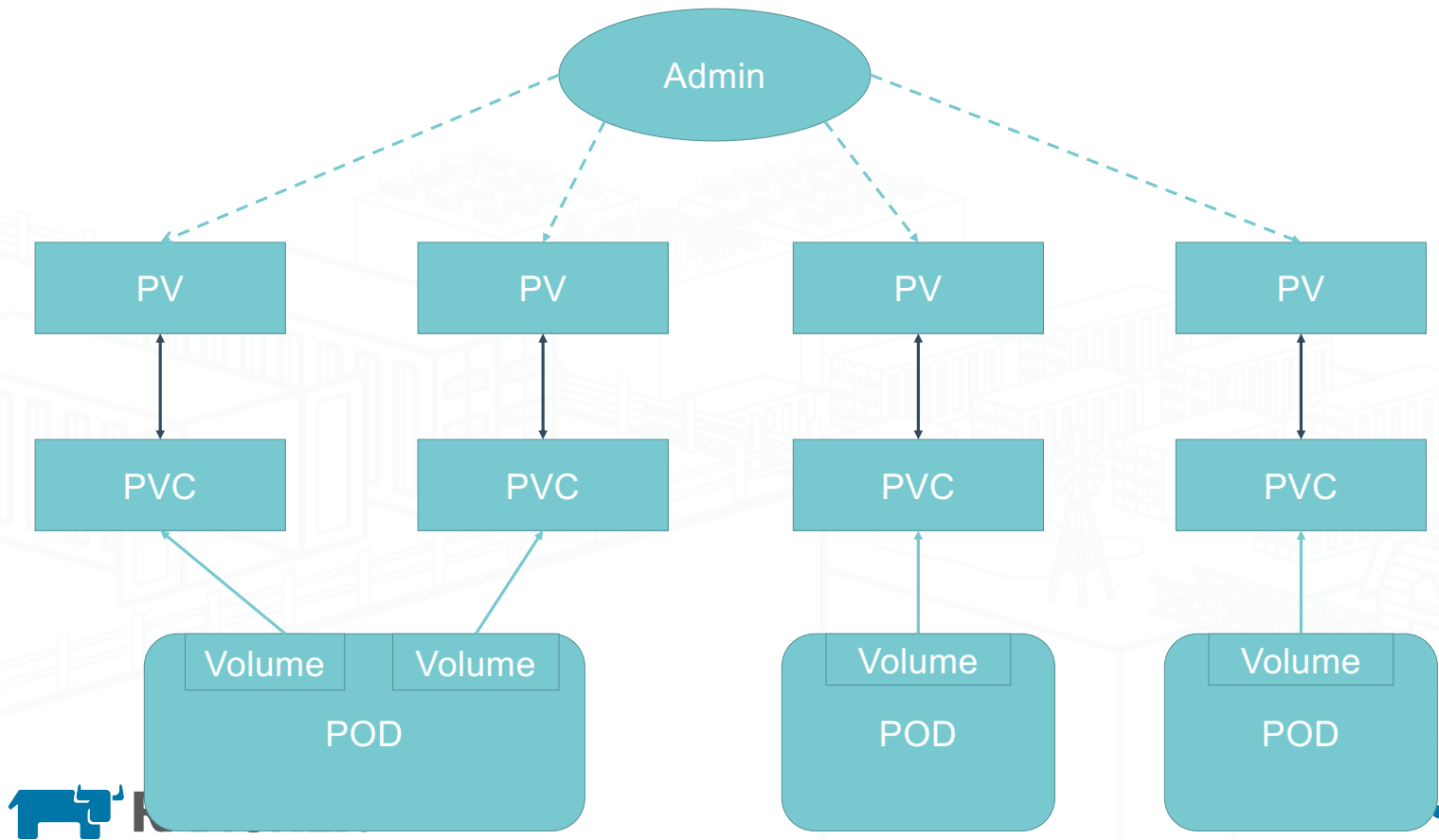


Persistent storage in Kubernetes

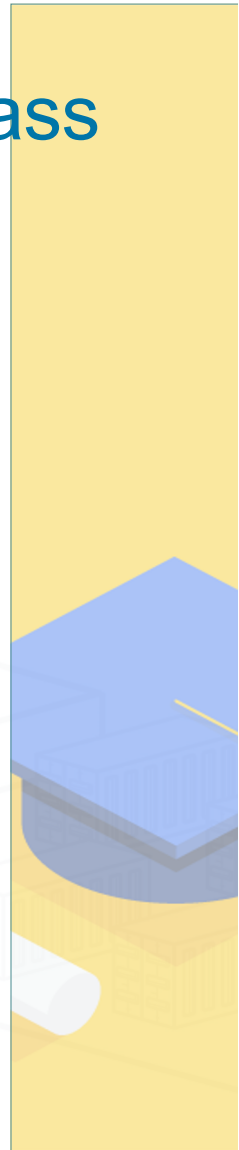
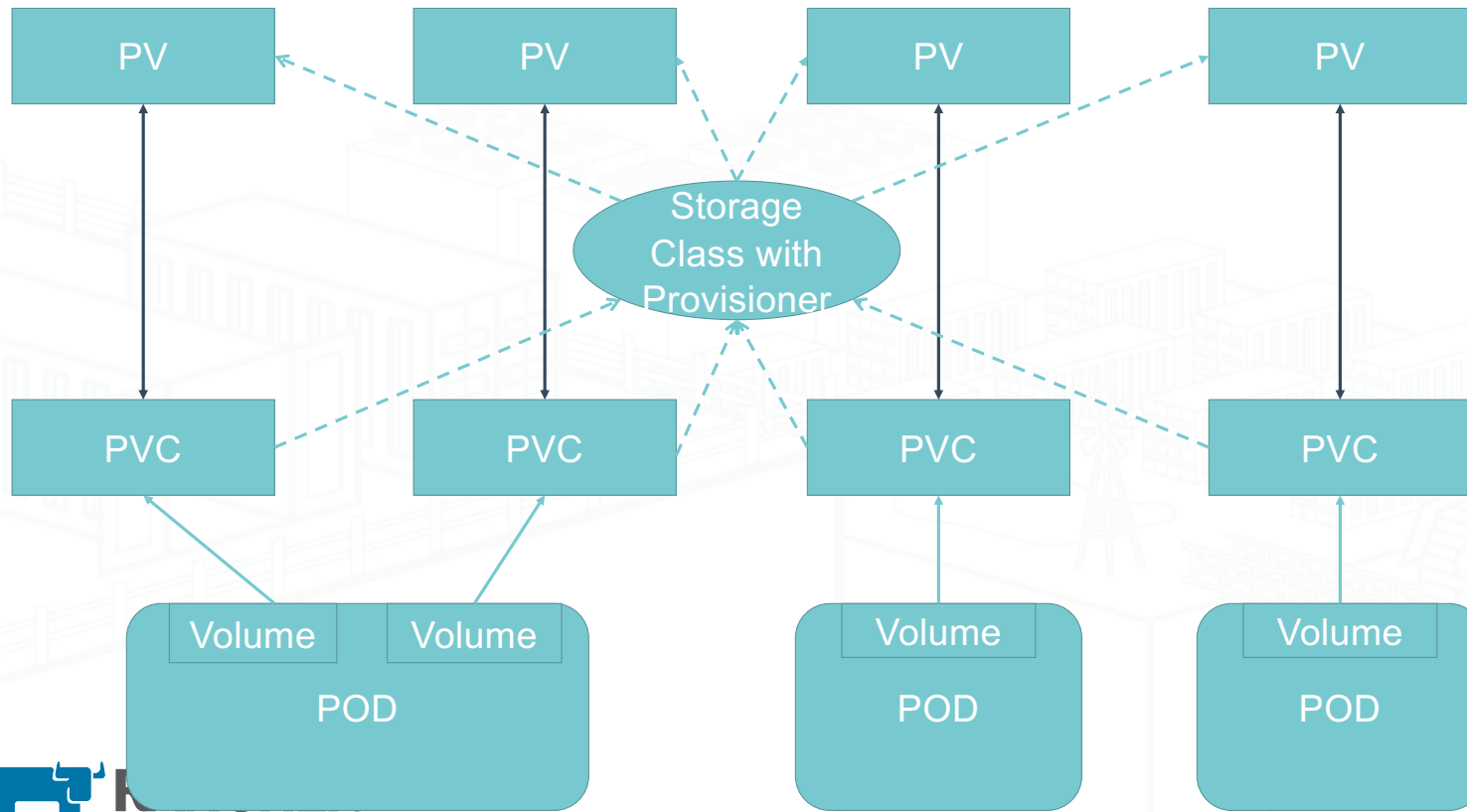
- **Persistent Volume**
 - A piece of storage can be used for Kubernetes
- **Persistent Volume Claim**
 - A request for PV
- **Storage Class**
 - A collection of PV
- **Provisioner**
 - Used to provision PV
- **Volume**
 - Referring to the storage used by the Pod



Persistent storage in Kubernetes before StorageClass

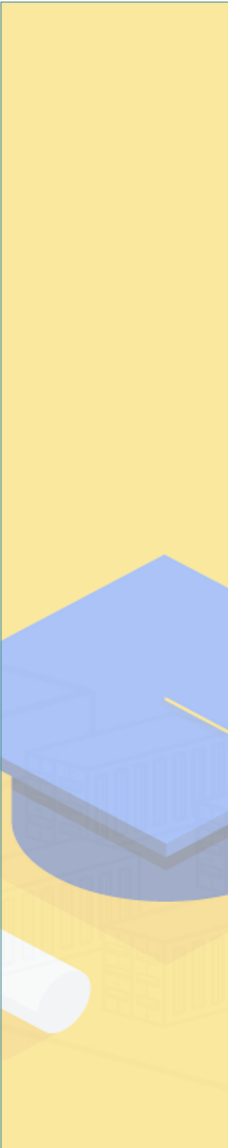


Persistent storage in Kubernetes after StorageClass



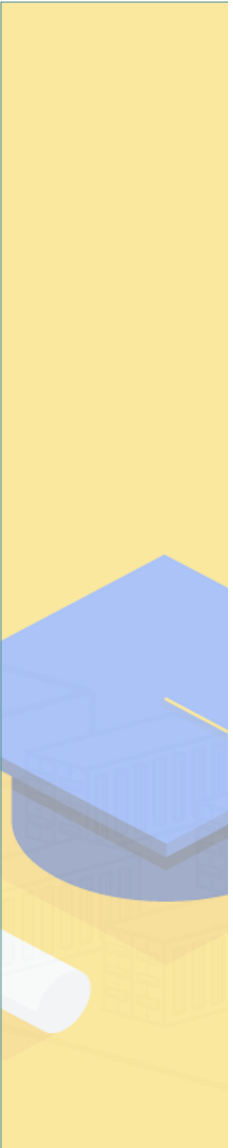
RWO vs RWX

- PV has three access modes
 - Read-Write-Once (RWO)
 - Read-Write-Many (RWX)
 - Read-Only-Many (ROX)
- Read-Write-Once type storage only can be read/write on one node at any given time
 - High performance block device
 - AWS EBS, Azure Disk, Google Persistent Disk, Ceph RBD, Longhorn
- Read-Write-Many type storage can be read/write on multiple nodes at the same time
 - Distributed Filesystem
 - AWS EFS, NFS, GlusterFS, CephFS



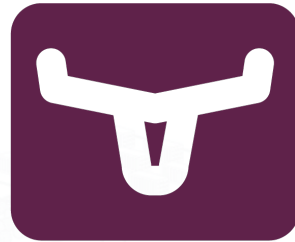
Deployment vs StatefulSet

- Pods in one Deployment share the same volume
 - No matter which node the pod runs on
 - Better suit for RWX type storage
- Each Pod in one StatefulSet can have one volume
 - VolumeClaimTemplate
 - Better suit for RWO type storage





**CLOUD NATIVE
COMPUTING FOUNDATION**

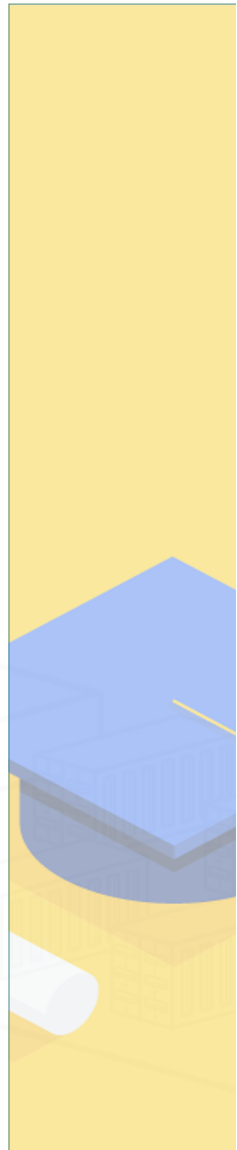


LONGHORN

Open Source
Distributed Block Storage Software
For Kubernetes

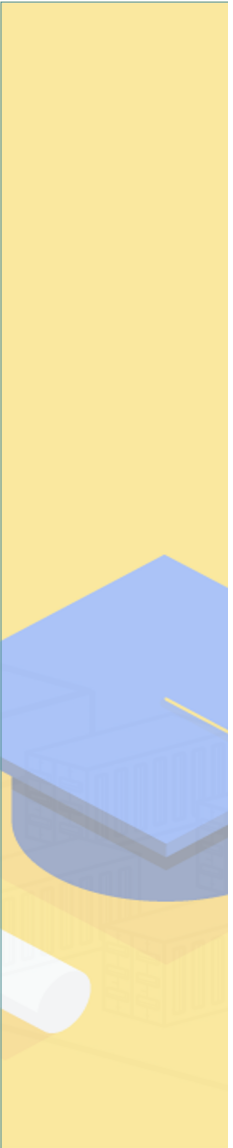
<https://longhorn.io/>

One click to add persistent storage support to any Kubernetes cluster

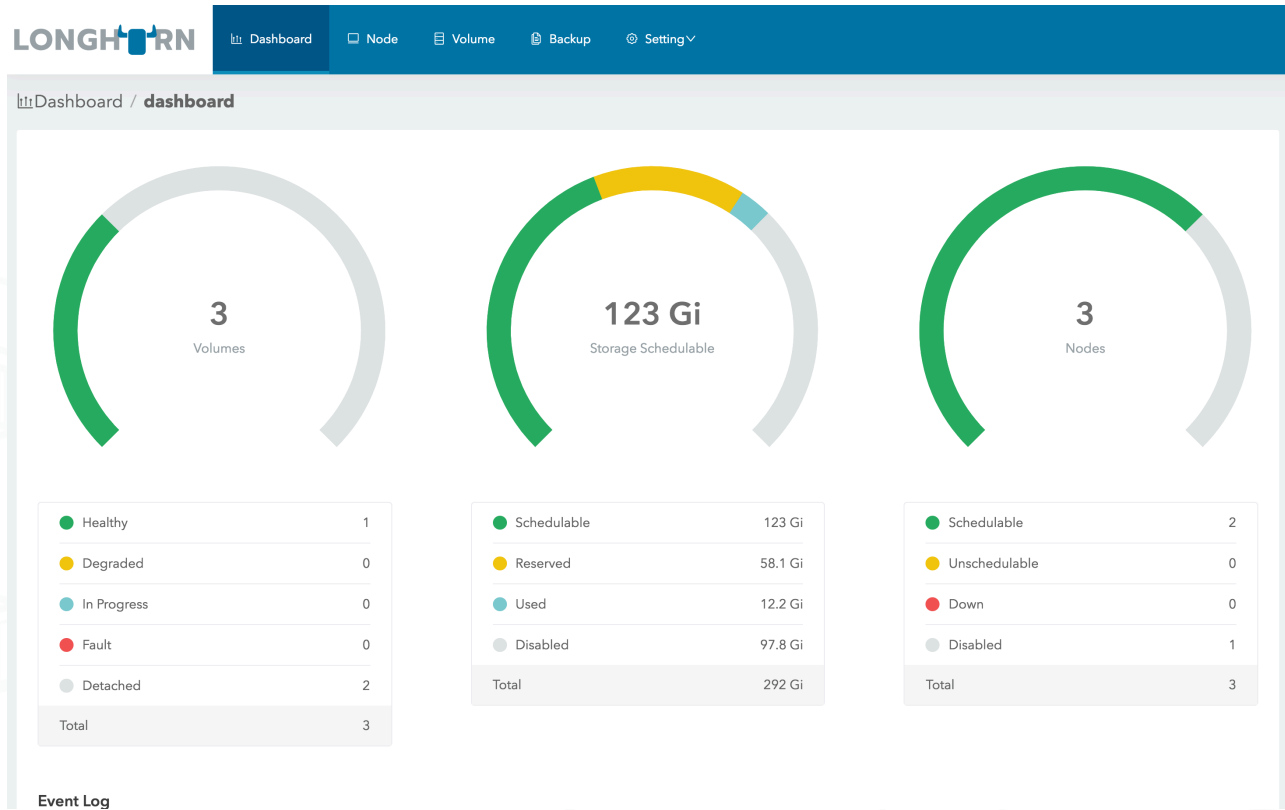


Latest release: Longhorn v0.7.0 (Beta)

- Enterprise-grade distributed block storage software for Kubernetes
- Volume snapshots
- Volume backup and restore
- Storage Tag for node and disk selection
- Cross-cluster disaster recovery volume with defined RTO and RPO
- Live upgrade of Longhorn software without impacting running volumes
- Intuitive UI
- One click installation
- And more...

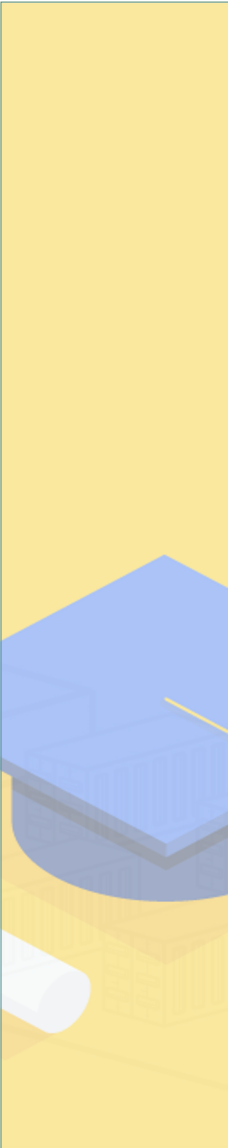


In Action



Upcoming Longhorn releases

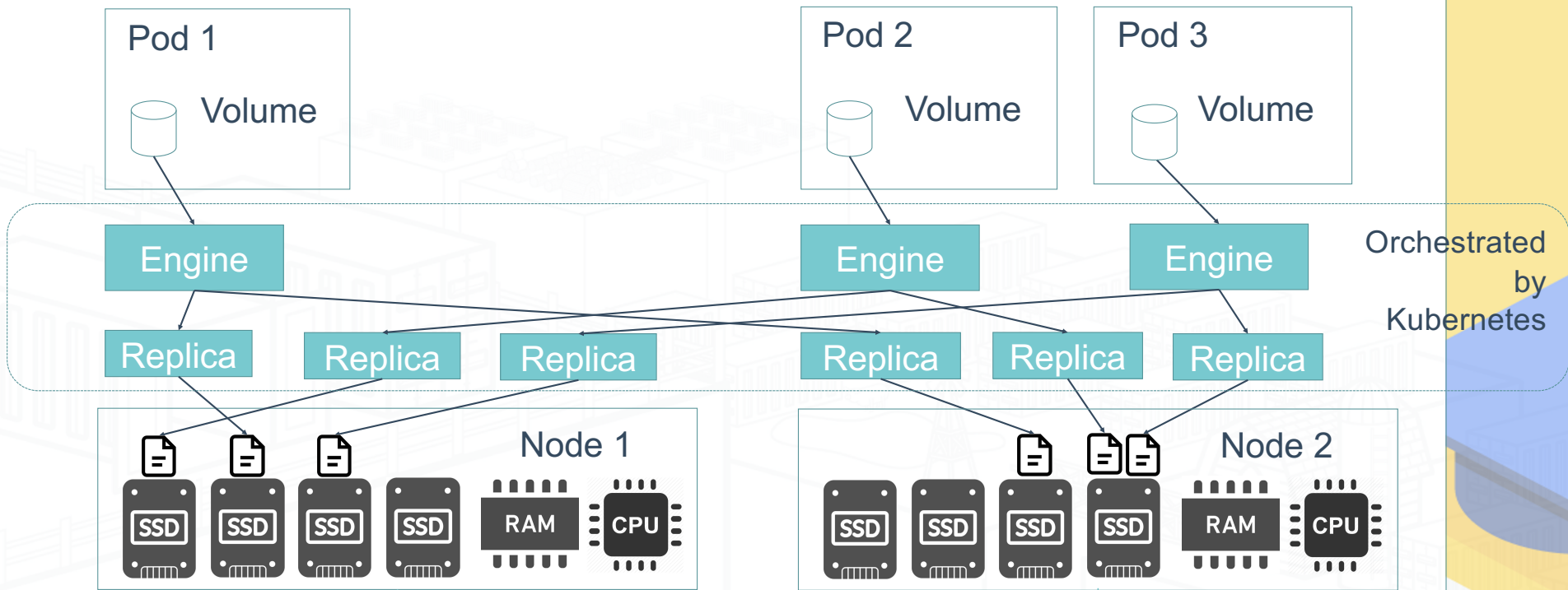
- Longhorn v0.8.0
 - Volume resizing
 - Kubernetes Topology support
 - Previously known as failure-domain
 - Live upgrade v2
- Longhorn v1.0 GA
 - Target date: Q2 2020
- Follow the latest update at <https://github.com/longhorn/longhorn/milestones>



Thank you



Longhorn Architecture - Engine



Longhorn Architecture - Manager

