

Cloud Native MySQL

Running MySQL on Kubernetes

Peter Zaitsev,
Founder at Percona
1 Feb 2024





Cloud Native MySQL

What Do you think when you hear Cloud Native MySQL?

Cloud Vendors Take



Give Control and Leverage to the Cloud Vendor



Another Cloud Native



Another
Cloud Native



CLOUD NATIVE
COMPUTING FOUNDATION

Kubernetes

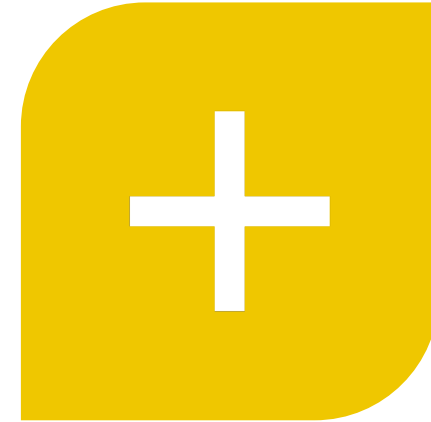


kubernetes

How to run MySQL on Kubernetes



REGULAR CONTAINER(S)



OPERATOR

Helm





All those Choices...

Many ways to Run MySQL on Kubernetes

Kubernetes Tutorial

```
spec:
  containers:
  - image: mysql:5.6
    name: mysql
    env:
      # Use secret in real usage
      - name: MYSQL_ROOT_PASSWORD
        value: password
    ports:
      - containerPort: 3306
        name: mysql
    volumeMounts:
      - name: mysql-persistent-storage
        mountPath: /var/lib/mysql
  volumes:
  - name: mysql-persistent-storage
    persistentVolumeClaim:
      claimName: mysql-pv-claim
```

<https://kubernetes.io/docs/tasks/run-application/run-single-instance-stateful-application/>

Bitnami Helm Chart

Deploy MySQL Replication

Rather Mature

Lots of Configuration Options

Does not manage full lifecycle as Operator

<https://bitnami.com/stack/mysql/helm>



Kubernetes Operator

Implement “Human Operator” Logic

Day Two

**Custom Logic to Bring current state to
Desired Resource Definition**

Healing; Scaling; Upgrades; Backups

Best Practice

**For Complicated Stateful applications, like
Databases look for Operators for Long Term
Production Deployments**

MySQL Operator

Oracle Has Developed official Operator For MySQL

Relies on MySQL Group Replication

MySQL Router for Query Routing

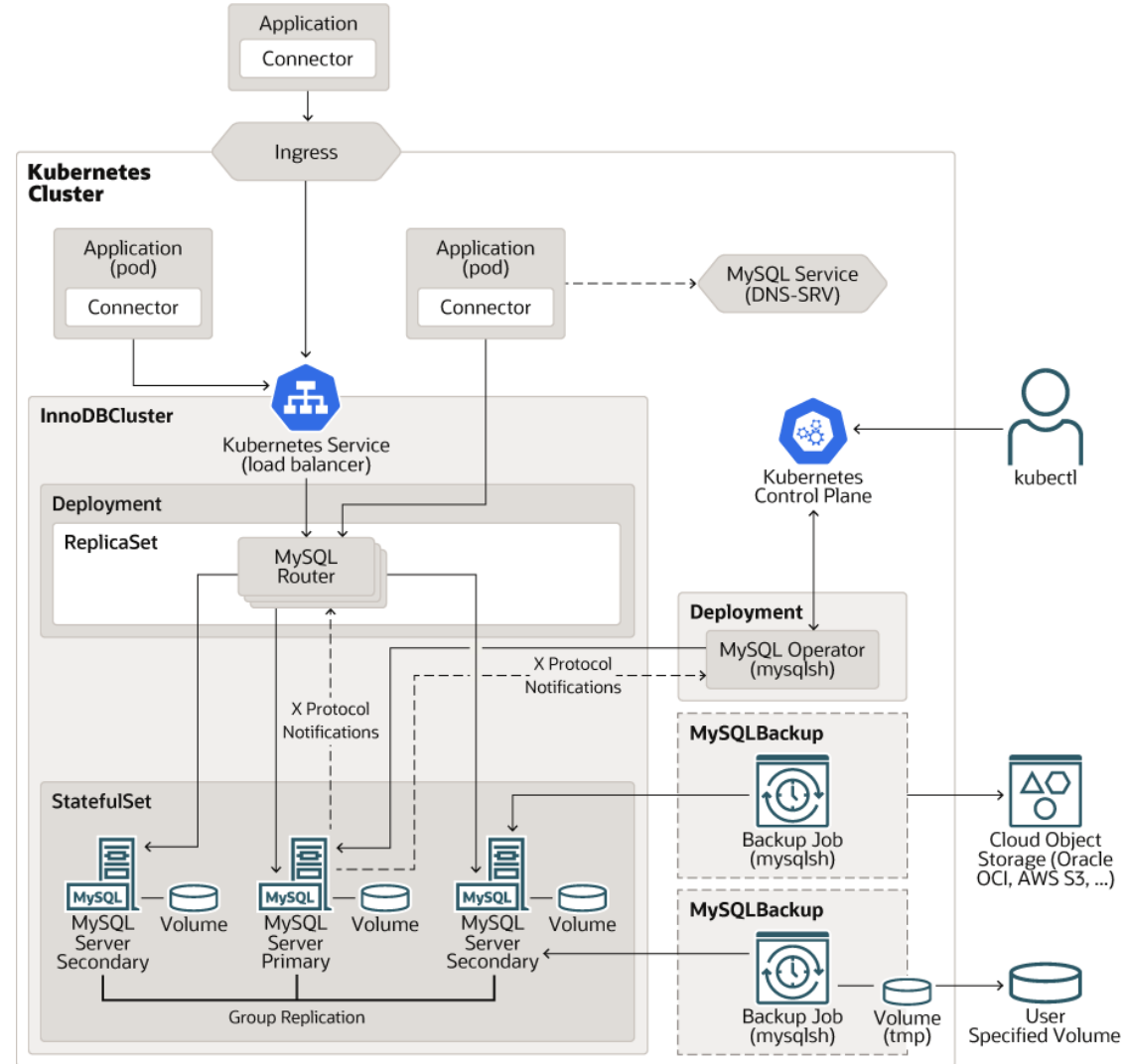
MySQL Shell; Python

Text Backups; Clone Support

UPL (Universal Permissive License) Licensed

<https://dev.mysql.com/doc/mysql-operator/en/>

MySQL Operator Visual



Percona Operators

Has been around for long time

Percona XtraDB Cluster Based Operator (Galera)

Percona Server Based Operator (Beta)

HaProxy and ProxySQL

Backups with Point in time Recovery

Multi-Cluster support

<https://www.percona.com/software/percona-operators>

Bipoke (ex Presslabs)

First Operator on the Market

Uses Percona Server and Async Replication

Automatic Replication Lag Management

Not very actively developed

<https://www.percona.com/blog/run-mysql-in-kubernetes-solutions-pros-and-cons/>

MOCO

Developed by Cybozu for their Internal Needs

Semi-Sync Replication Based

MySQL Shell for Backup and Restore

<https://cybozu-go.github.io/moco/setup.html>

Vitess

Better than MySQL ? Not Quite MySQL

CNCF Project

Killer Feature: Sharding

<https://vitess.io/>

Beyond Kubernetes UX (Beta)

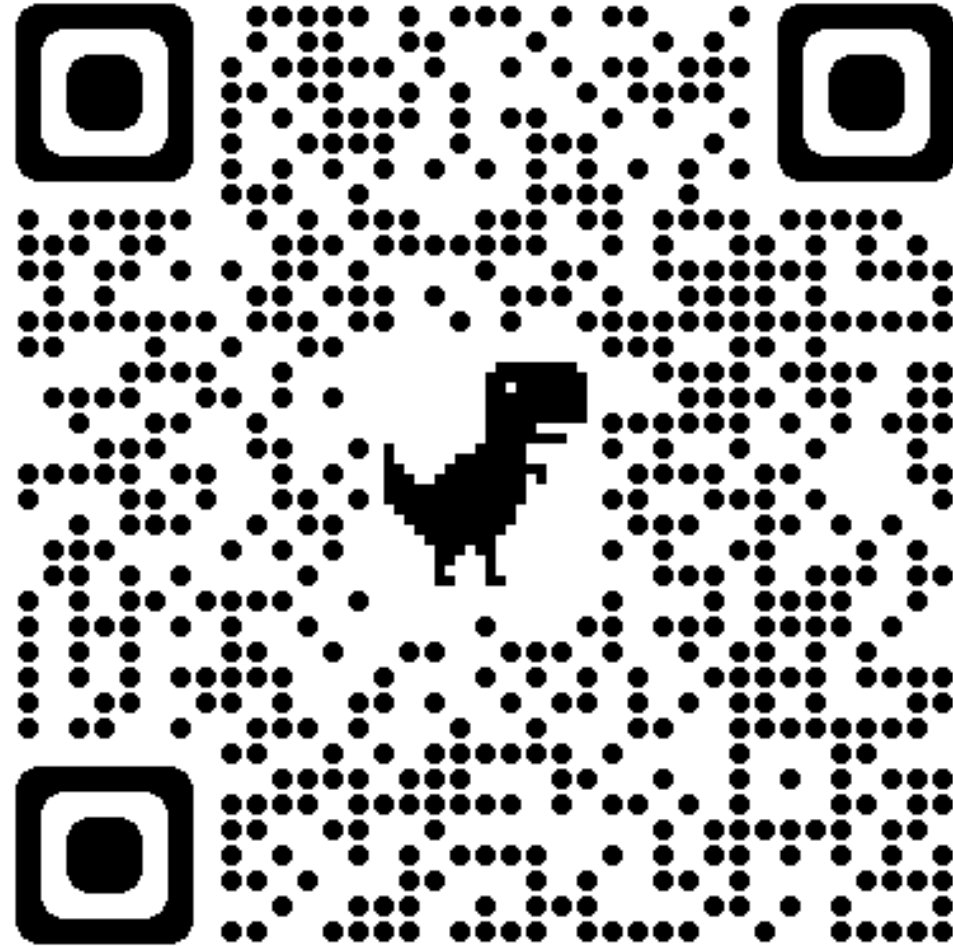
The screenshot shows the Percona Everest configuration interface. At the top, the Percona Everest logo is on the left, and a help icon and user profile icon are on the right. Below the logo, a progress bar shows steps 1 through 6, with step 1 (Resources) selected. The main section is titled 'Resources' with the instruction 'Configure the resources your new database will have access to.' It features three tabs: 'Number of nodes' (with options 1 node, 3 nodes, 5 nodes), 'Resource size per node' (with options Small, Medium, Large, Custom), and 'Custom' (which is selected). Under the 'Custom' tab, there are three input fields: 'CPU' (set to 4, with a note 'x 3 nodes = 12 CPU' and 'Estimated available: 16.434 CPU'), 'MEMORY' (set to 8 GB, with a note 'x 3 nodes = 24 GB' and 'Estimated available: 31.188611456 GB'), and 'DISK' (set to 100 GB, with a note 'x 3 nodes = 300 GB'). At the bottom, there are 'Previous', 'Cancel', and 'Continue' buttons. On the right side, a 'DATABASE SUMMARY' panel is visible, showing '1. Basic Information' (Type: MySQL, Name: mysql-sgw, Version: 8.0.32-24.2, Storage class: do-block-storage) and '2. Resources' (Number of nodes: 3, CPU: 12 CPU, Memory: 24 GB, Disk: 300 GB). Below this, a list of features is shown: 3. Backups, 4. Point-in-time Recovery, 5. Advanced Configurations, and 6. Monitoring.

<https://percona.community/blog/2023/10/30/building-and-running-percona-everest-from-source-code/>

And
Remember...



Further Reading



<https://www.percona.com/blog/run-mysql-in-kubernetes-solutions-pros-and-cons/>

Thank you, Let's Connect!

<https://www.linkedin.com/in/peterzaitsev/>

<https://twitter.com/PeterZaitsev>

<http://www.peterzaitsev.com>