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Has been developing deployment, update and monitoring systems since 2004.

# WHAT IS A KUBERNETES OPERATOR?



# WHY IS OPERATOR NEEDED?

## WHY IS OPERATOR NEEDED?

# Automated provisioning

- High Availability and Failover
- ► Scaling
- Backups and Restores
- lates

# IN WHAT CASE SHOULD I RUN A DATABASE IN KUBERNETES?



# WHAT IF I HAVE XXL SIZE?

### **VITESS OPERATOR / PLANETSCALE**



### Vitess is a database clustering system for horizontal scaling of MySQL through generalized sharding



## **VITESS OPERATOR / PLANETSCALE**

- Solution for Sharding
- Open Source, CNCF graduated project
- Outstanding level of engineering but solution is complex for non-experts
- Both Asynchronous and Semisynchronous replication supported High Aviability based on Orchestrator and replication
- Physical backups to S3, GCS, Ceph



# **RECOVERY POINT OBJECTIVE (RPO) RECOVERY TIME OBJECTIVE (RTO)** SIMPLICITY = MAINTAINABILITY



### REPLICATION

Orchestrator)



Needs external failover hadling ( e.g. Orchestrator)

- Semi-sync
- Eventual delivery
- Source <-> Replica
- Replica pull binlogs Replica ack after flush to disk (slow)

Sync

- Sync delivery
- Members <->
  Members
- Push on TRX commit
- Ack from All (Galera) or Majority (GR)
- Automatic handling
  of membership

it a)

### REPLICATION

Async Performance (write) QPS) - Best Recovery point objective - Non-zero Recovery time objective - Tens of seconds

Complexity/Expertise - Low

- Semi-sync
- Performance (write) QPS) - Worst
- Recovery point objective - Zero
- Recovery time objective - Tens of seconds
- Complexity/Expertise - Low

### Sync

- Performance (write) QPS) - Average
- Recovery point objective - Zero
- Recovery time objective - Seconds
- Complexity/Expertise - Medium



### MYSQL OPERATOR / ORACLE



### The MySQL Operator for Kubernetes is a solution for managing MySQL InnoDB Cluster setups inside Kubernetes.

## **MYSQL OPERATOR / ORACLE**

- Solution for MySQL InnoDB Cluster
- Open Source, can run Enterprise Edition
- Technology Preview, not ready for production
- Rightly designed synchronous replication utilized
- Logical backups to Oracle Cloud

### **MYSQL OPERATOR / BITPOKE**





## **MYSQL OPERATOR / BITPOKE**

- Was known as Presslabs MySQL Operator
- Open Source
- Simple and reliable, production ready
- Both Asynchronous and Semisynchronous replication supported High Aviability based on Orchestrator and replication
- Physical backups to S3, GCS

### PERCONA DISTRIBUTION FOR MYSQL OPERATOR - PXC

### The Kubernetes Operator for MySQL is a solution for managing Percona XtraDB Cluster setups inside Kubernetes.



## PERCONA DISTRIBUTION FOR MYSQL OPERATOR - PXC

- Solution for Percona XtraDB Cluster
- > Open Source
- Most featurefull database operator, Production Ready
- Synchronous replication based on Galera Replication
- Physical backups to S3, GCS

### PERCONA DISTRIBUTION FOR MYSQL OPERATOR - PS

### The Kubernetes Operator for MySQL is a solution for managing Percona Server setups inside Kubernetes.



## PERCONA DISTRIBUTION FOR MYSQL OPERATOR - PS

- Solution for Percona Server
- Open Source
- Technology Preview, not ready for production
- Both Asynchronous and Semisynchronous replication supported High Aviability based on Orchestrator and replication
- Backup are coming

## WHICH OPERATOR SHOULD BE USED IN PRODUCTION?



