

Database Workloads on OpenShift Container Platform

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High Availability

Single-node deployment

- ▶ Kubernetes provides high availability for stateless workloads
- ▶ Storage access mode make stateful HA more complicated
- ▶ ReadWriteOnce precludes mounting on a second node
- ▶ Kubernetes needs to first confirm the original node is down
- ▶ Long-standing Kubernetes defects prevent this from happening

High Availability

Node Remediation

- ▶ OpenShift provides node remediation
- ▶ The Machine Health Check operator detects failures
- ▶ The Poison Pill operator reboots the machine
- ▶ The medik8s project closes the gaps in supported environments

High Availability

Database Replication

- ▶ Most databases provide their own data replication features
- ▶ Database cluster means HA without downtime
- ▶ Cluster functionality typically requires quorum of $(n/2)+1$
- ▶ Small cluster size of 3 can tolerate a single node failure
- ▶ Node recovery is important to survive the next failure cycle

High Availability

Validation

- ▶ MongoDB ReplicaSet on OpenShift
- ▶ CockroachDB, cloud-native database
- ▶ Recovery issue reproduced in both scenarios
- ▶ Solution validated with MHC or NHC, and Poison Pill

Disaster Recovery

Cross-region with CockroachDB

- ▶ Simple installation and configuration using ACM and Submariner
- ▶ Deployed across heterogeneous environments
- ▶ Validated on-prem, on AWS, GCP, and a combination of all three
- ▶ Architecture is active-active disaster recovery

Horizontal Scaling

MongoDB on OpenShift

- ▶ MongoDB replicaset allows horizontal scaling of read operations
- ▶ There is only one primary node supporting write operations
- ▶ Some use cases have very high write to read ratio
- ▶ MongoDB Sharding allow multiple replicaset and multiple primaries
- ▶ Throughput benefits quickly realized after 3 shards

Thank you

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