

# Run High-Performance, Resilient Databases on Kubernetes with Diamanti and MariaDB

Containers and microservices architecture drive tremendous performance and agility benefits for enterprises whose businesses rely heavily on databases. In contrast, running legacy databases like Oracle and Sybase mean overprovisioning, slow deployments, costly licensing, and difficult scaling. What's more, it's not practical to run them in containers.

However, databases built to run on Kubernetes present significant challenges to IT operations teams in terms of persistence, data protection, and high availability. Persistent storage is a fundamental requirement for many containerized applications, but it is much more complex to configure in Kubernetes than CPU and memory, which follows a simple declarative model. Furthermore, storage adds layers of abstraction, as well as latency. Without an effective solution for persistent storage and data protection, many organizations turn to running certain database services outside of the cluster, which can hamper performance and degrade management efficiency.



## High Performance Throughout the Entire Cloud-Native Database Stack

Enterprises seeking substantial performance gains over their legacy enterprise database solutions and supporting infrastructure will benefit tremendously from running MariaDB on the Diamanti Bare-Metal Container Platform.

MariaDB is a full-featured database solution with a lightweight, portable runtime that's well-suited for containers. The performance it achieves is a function of MariaDB's innovative Kubernetes implementation that enables load balancing of database reads and writes. For example, if the database is configured to support an IOPS-intensive application, read operations can be farmed out to a set of slave databases, while the master database handles write operations. MariaDB also features a smart layer that monitors the underlying databases and enables scaling of the deployment accordingly.

MariaDB's fast database performance is further enhanced when MariaDB is run on the Diamanti Bare Metal Container Platform. Each Diamanti four-node cluster delivers close to 4 million IOPS, driven by blazing-fast NVMe block storage with latency on the order of less than 100 microseconds. Diamanti easily scales performance in lock-step with MariaDB databases, and offers per-container Quality-of-Service to ensure that database SLAs can always be met without the risk of being resource-starved by noisy neighbor workloads. No other container infrastructure solution offers this degree of control over storage and network performance.

## Diamanti Speeds Deployment of Resilient MariaDB Databases With Streamlined Workflows and Enterprise-Grade Data Protection

The Diamanti platform's intuitive workflows dramatically simplify the deployment of MariaDB databases on Kubernetes. For database administrators, it is easy to define storage requirements of database containers by creating new storage claims in just a few clicks. This self-service aspect of the Diamanti platform gives developers and application owners more control over resources, without having to burden IT Operations. Furthermore, the Diamanti platform's integrated NVMe storage obviates the need for external legacy storage solutions which don't work well in cloud-scale environments. This also saves IT operations teams from substantial configuration headaches.

## Diamanti at a Glance

### SPEED

- Turnkey Kubernetes infrastructure deploys in 15 minutes
- 4 million IOPS per four-node cluster
- Up to 32GB of fast NVMe flash storage per node
- 200µs latency across the cluster

### SIMPLICITY

- Plug-and-play Kubernetes cluster deployment
- Streamlined workflows for persistent storage configuration and snapshots
- 24x7 full-stack support

### DATA PROTECTION AND RESILIENCE

- Enterprise-grade data protection based on efficient snapshots
- Schedulable non-disruptive backups
- Multi-zone clustering for infrastructure and application HA

## MariaDB at a Glance

- Full-featured, lightweight database runtime
- Ideal for containers
- Innovative read/write load-balancing enhances performance

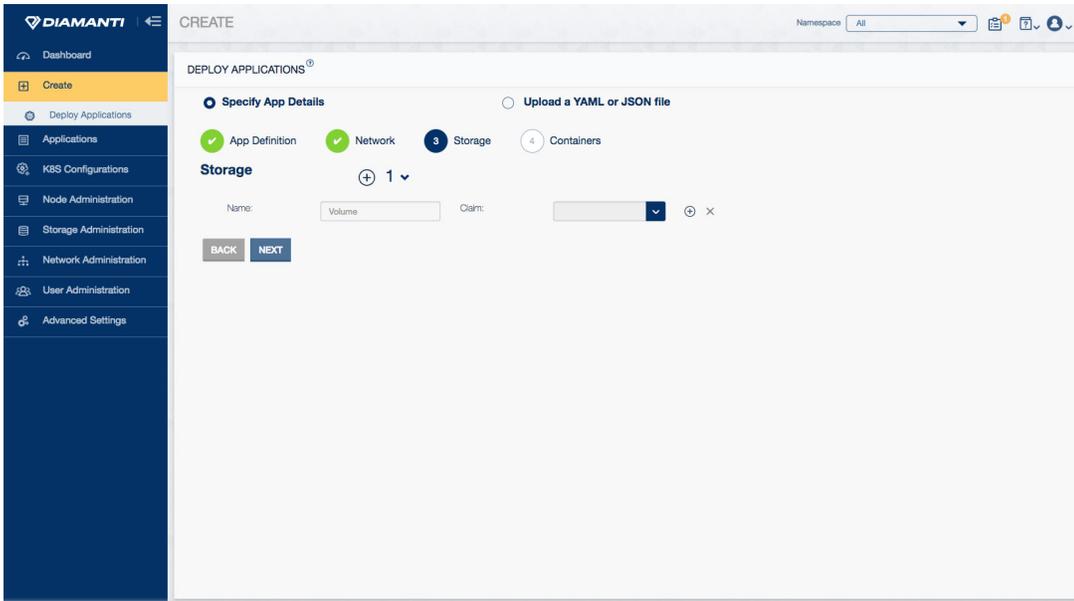


FIGURE 1: Persistent Storage Configuration Workflow in the Diamanti Platform User Interface

## Snapshot-based Data Protection

Protecting enterprise databases is both critical and challenging, considering the ephemeral nature of containers. Diamanti offers robust data protection based on allocate-on-write snapshots. The Diamanti snapshot controller seamlessly integrates with Kubernetes to create volume snapshots that can be managed directly through the Diamanti platform interface. Backups of MariaDB volumes are performed using snapshots and are completely schedulable and configurable per application. Furthermore, this point-in-time backup approach works without the need to interrupt running database services.

## Diamanti Multi-Zone Clustering Enhances MariaDB High Availability

High Availability (HA) is a must when it comes to running mission-critical databases. For such purposes, Diamanti enables users to set up a Kubernetes environment and deploy MariaDB databases across multiple availability zones (failure domains) in order to achieve zone-level resiliency and fault isolation. As a result, MariaDB workloads will not experience any service disruption in the event of a zone failure.

# A Complete, Cloud-Native Database Stack That's Fast, Resilient, and Easy to Manage

Enterprise organizations seeking to modernize the monolithic databases that support business-critical applications will realize substantial performance gains by running container-friendly MariaDB databases on Diamanti's high-performance NVMe-equipped Bare-Metal Container Platform. Diamanti dramatically simplifies persistent storage configuration and data protection for MariaDB workloads, and enhances application and infrastructure availability through its multi-zone clustering feature.

## About Diamanti

Diamanti's bare-metal container platform gives infrastructure architects, IT operations, and application owners the speed, simplicity, efficiency, and control they need to run stateful containerized applications at scale. With open-source Docker and Kubernetes fully integrated, together with purpose-built hardware and complete support for the entire stack, the Diamanti platform is a proven full container stack that deploys in minutes.

## About MariaDB

With MariaDB you can break free from the costs, constraints and complexity of proprietary databases and reinvest in what matters most, developing innovative applications and services as fast as possible. Experience the same benefits as customers like Deutsche Bank, DBS Bank, Nasdaq, The Home Depot, ServiceNow, and Verizon – industry leaders who trust MariaDB to deliver unmatched operational agility, provide enterprise reliability and drive collaborative innovation.