CANONICAL

MongoDB

Training Curriculum

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Introduction and scope

MongoDB is a NoSQL database management application. Organisations use MongoDB because it aligns with modern application development needs, offering flexibility, scalability and high performance. It has a rich set of features that support complex and evolving business requirements. Its ability to handle diverse data types, ease of use, cost-effectiveness, and robust security and support services make it a preferred choice for many large organizations.

Objective of the Training

After completing this training, participants will have a strong understanding of Canonical's Charmed MongoDB solution.

We begin by introducing MongoDB, explaining its architecture and primary features. We show how MongoDB clusters can be manually deployed, configured, monitored and backed up.

The participants will be familiarized with the MongoDB shell and the commands to manipulate data or perform administrative tasks.

Once we have solidified the MongoDB concepts, we'll show how Charmed MongoDB can facilitate deploying and operating MongoDB clusters on various infrastructures such as public clouds, Kubernetes, bare metal machines or LXD system containers.

Juju is an orchestration engine that plays an essential role and will be presented in detail. To fully benefit from Juju, we'll show how users can integrate their own applications with Charmed MongoDB, analyzing a simple Python web application and its charm.

Monitoring is essential for ensuring the availability, consistency and performance of a database. As such, we are introducing the Canonical Observability Stack (COS). The participants will visualize the aggregated metrics and logs in Grafana and use alerts to quickly be notified when the cluster experiences difficulties.

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Training Agenda

Day 1 - MongoDB Introduction

Overview of MongoDB

MongoDB Architecture

- Document database
- Indexes
- Clustering
- Replication
- Sharding
- Backup and restore
- Backing up data files
- Using mongodump
- PBM backups
- Monitoring, profiling and tuning

Lab 1: Manually setting up MongoDB

- Installing Multipass
- Preparing MongoDB VMs
- Installing MongoDB
- Basic usage
- Configuring replica sets

Creating a web application

- Creating a web application using MongoDB
- Installing the application
- Using the application
- Code deep dive

Day 2 - Charmed MongoDB

Charmed MongoDB introduction

- Hyper-automated MongoDB®, available on any cloud
- Secured and supported for 10 years
- Simple pricing per node
- Other services of Canonical
- Canonical's MongoDB stack

Overview of Juju

- Juju concepts

Lab 2: Charmed MongoDB Snap and Container Image

- Snap package
- ROCK (OCI image)

Lab 3: MongoDB backup and monitoring

- Setting up PBM
- Using PBM
- MongoDB monitoring

Day 3 - Charmed MongoDB advanced

Lab 4: Deploying Charmed MongoDB (K8s operator) in Kubernetes

- Setting up Juju and MicroK8s
- Using the MongoDB charm
- Replication / HA with Charmed MongoDB
- Observability
- Deploying COS Lite
- Accessing Grafana
- Creating a web application using Charmed MongoDB
- Building the charm
- Charm structure

Lab 5: Deploying Charmed MongoDB (VM operator) in Virtual Machine

- Setting up Juju with MicroCloud
- Deploying MongoDB
- User management
- TLS configuration
- Backups
- Sharding

Lab 6: Deploying Charmed MongoDB on GKE

Additional Topics

If there is any remaining time during the Training, the trainer will make efforts to cover additional topics or provide clarifications based on questions from the customer during the training session.