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Updated 05/28/2024

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# Ceph Training: Open-Source Distributed Storage

2 days (14 hours)

## Presentation

Manage your data storage intelligently with our Ceph training course. We'll teach you step-by-step how to efficiently manage Ceph clusters while guaranteeing high availability.

On this program, you'll learn about the fundamental concepts and components of Ceph, such as monitors, managers, Object Storage Daemons (OSDs) and Metadata Server Daemons (MDSs). You'll also gain an understanding of the inner workings of this tool, thanks to our architecture section.

Thanks to this training course, the deployment and administration of Ceph clusters will no longer hold any secrets for you. We'll explain how to use CRUSH maps, APIs, RADOSGW and RBD for block storage.

By the end of this course, you'll also know how to integrate Ceph with Kubernetes or OpenStack and fix the most common problems.

As with all our training courses, we'll be teaching you the latest version of the reef 18 tool.

## Objectives

- Understanding the basics of Ceph
- Mastering Ceph architecture
- Be able to deploy and configure a Ceph cluster
- Efficiently managing a Ceph storage cluster
- Integrate Ceph with Kubernetes using Rook

## Target audience

- System administrators
- Network administrators
- Data engineers
- Database administrators
- Developers
- Architects

# Prerequisites

Knowledge of Linux systems administration.

# Ceph training program

## Introduction to Ceph

- What is Ceph?
- Recent developments
- Use cases
- Cluster components
  - Monitors
  - Managers
  - Ceph OSDs
  - MDSs

## Ceph architecture

- Presentation of architectural elements
- Cluster Map
- Single monitor vs. multiple monitors
- Ceph's scalability
- OSD members and their statutes
- Pool presentation
- Calculate PG IDs
- How do you ensure high availability?

## Deploying a Ceph cluster

- Preparing the environment
- Ceph installation
- Configuration
- Create a cluster
- Add or remove a monitor
- Key management
- OSD management
- Add or delete an MDS

## Ceph storage cluster

- Understanding CRUSH maps
- Pool management
- Extending clusters
- The most common operations to master
- The case of multinode clusters
- APIs overview
- How do I use RADOSGW for object storage?
- How do I use RBD for block storage?
- Using CephFS for file storage
- Data replication
- Recovery process

### Network configuration

- Prerequisites
- IP table configurations
- Component configuration
  - MY
  - MDS
  - MGRs
  - OSD
- Ensuring data security
- Isolate the cluster network
- OSD NIC in two cluster networks
- Tuning and performance optimization

### Integration

- Integration with OpenStack
- Integration with Kubernetes via Rook

### Troubleshooting

- Monitoring
- Best practices
- Common mistakes to avoid

## Companies concerned

This training course is aimed at both individuals and companies, large or small, wishing to train their teams in a new advanced computer technology, or to acquire specific business knowledge or modern methods.

## Positioning on entry to training

Positioning on entry to training complies with Qualiopi quality criteria. As soon as enrolment is confirmed, the learner receives a self-assessment questionnaire enabling us to

assess their estimated level of proficiency in different types of technology, and their expectations and personal objectives for the training to come, within the limits imposed by the selected format. This questionnaire also enables us to anticipate any connection or internal security difficulties within the company (intra-company or virtual classroom) that could be problematic for the follow-up and smooth running of the training session.

## Teaching methods

Practical course: 60% Practical, 40% Theory. Training material distributed in digital format to all participants.

## Organization

The course alternates theoretical input from the trainer, supported by examples, with brainstorming sessions and group work.

## Validation

At the end of the session, a multiple-choice questionnaire verifies the correct acquisition of skills.

## Sanction

A certificate will be issued to each trainee who completes the course.