

Kubernetes storage expert

Duration: 5 days (8hrs/day)

Prerequisites:

- Basic knowledge of Linux Server Administration.
- Intermediate level knowledge of Kubernetes

Course Objective: A Kubernetes storage expert course is designed to equip a seasoned professional adept in orchestrating, provisioning, and managing storage solutions within Kubernetes clusters. They possess an in-depth understanding of Kubernetes storage concepts, including Persistent Volumes (PVs), Persistent Volume Claims (PVCs), and Storage Classes, and can proficiently deploy various storage technologies such as NFS, GlusterFS, Ceph, and cloud provider-specific solutions like AWS EBS and Azure Disk. With expertise in configuring storage resources to meet application requirements, optimizing performance, and ensuring data persistence and availability for stateful applications, they play a pivotal role in architecting resilient storage infrastructures. Additionally, they excel in troubleshooting storage-related issues, implementing data protection strategies, and integrating Kubernetes with external storage ecosystems, contributing significantly to the stability and reliability of containerized environments.

Kubernetes Version: Latest

Lab Requirement: Koenig-DC (<https://linuxlab.koenig-solutions.com>)

Module 1 – Introduction to On-Premises Kubernetes Storage

Recap PVs, PVCs, Storage Classes, and Volume Plugins.

Application of PVs, PVCs, Storage Classes, and Volume Plugins in on-premises Kubernetes environments.

Lab: PV, PVC and storage class demo

Module 2 – Selecting and Configuring Storage Solutions for On-Premises Kubernetes

Overview of storage options suitable for on-premises deployments, such as local storage, NFS, GlusterFS, and Ceph.

Lab: Setting up and configuring NFS as a storage solution in an on-premises Kubernetes cluster.

Module 3- Persistent Volume Management in On-Premises Clusters

Strategies for provisioning and managing Persistent Volumes in on-premises Kubernetes environments.

Lab: Dynamic provisioning of Persistent Volumes and Persistent Volume Claims.

Module 4 - Ensuring Data Persistence and High Availability

Design considerations for ensuring data persistence and high availability in on-premises Kubernetes clusters.

Overview of storage in stateful set

Lab: Deploying stateful applications with persistent storage and testing failover scenarios.

Module 5 - Optimizing Storage Performance in On-Premises Kubernetes

Techniques for optimizing storage performance

Tuning storage parameters and selecting appropriate volume types.

Lab: Performance benchmarking and optimization strategies for on-premises storage solutions.

Module 6 - Data Protection and Disaster Recovery

Implementing backup

Replication

Disaster recovery strategies for on-premises Kubernetes storage.

Lab: Configuring backup and recovery processes for critical data in an on-premises Kubernetes cluster.

Module 7 – Integration with On-Premises Storage Ecosystem

Integrating Kubernetes with on-premises storage ecosystem tools and technologies, including CSI drivers and monitoring solutions.

Lab: Integrating third-party storage solutions and monitoring tools into an on-premises Kubernetes environment.

Module 8 – Security and Compliance Best Practices

Addressing security considerations and compliance requirements for on-premises Kubernetes storage.

Lab: Implementing access control and compliance policies for on-premises storage resources.

Module 9 – Case Studies and Hands-On Exercises

Real-world case studies and hands-on exercises demonstrating best practices for deploying and managing storage in on-premises Kubernetes environments.

Opportunities for readers to apply concepts learned in the guide to real-world scenarios through practical exercises.