Kubernetes Administration with RKE2 (RKE201V2)

ID RKE201V2 **Price** CHF 2,235.—(excl. VAT) **Duration** 3 days

Who should attend

This course is primarily designed for system administrators, DevOps engineers, and cloud or platform engineers who need a technical introduction to Kubernetes administration and SUSE's specific distributions. It is also suitable for those responsible for managing production-grade container orchestration environments.

Prerequisites

Students should have a basic understanding of containerization concepts and be comfortable working within a Linux command-line environment. Prior experience with virtualization and general networking fundamentals is highly recommended.

Course Objectives

Attendees will be taught the following concepts and skills:

- Install and configure RKE2 clusters using server and agent nodes
- Manage Kubernetes workloads, including Deployments, StatefulSets, DaemonSets, and batch processing with Jobs and CronJobs
- Configure persistent storage using Volumes, PersistentVolumes, and the Container Storage Interface (CSI)
- Implement cluster networking and external access via Services, Ingress, and the Gateway API
- Secure the cluster environment through multi-layered API access control, RBAC, and NetworkPolicies
- Optimize resource usage by defining Quality of Service (QoS) classes, ResourceQuotas, and LimitRanges
- Execute maintenance and operations, including horizontal and vertical scaling, cluster upgrades, and etcd backups
- Manage complex applications using Helm charts and extend the Kubernetes API with CRDs and Operators

Course Content

Section 1: Course Overview

Section 2: Introduction to Containers and Container Orchestration

- Container Fundamentals
- The Need for Orchestration
- Introduction to Kubernetes

Section 3: Kubernetes Distributions by SUSE

- Understand the SUSE Kubernetes Distributions
- Install RKE2

Section 4: Basic Kubernetes Objects and Commands

- Core Kubernetes Objects and Their Relationships
- Create Kubernetes Objects
- Retrieve Information about Kubernetes Objects
- Command-line Efficiency Tips and Tricks

Section 5: Running Workloads in Kubernetes

- Namespaces to Group Kubernetes objects
- Workloads and the Relationship with Pods
- ReplicaSets and Deployments for Stateless Applications
- StatefulSets for Stateful Applications
- Batch Processes using Jobs and CronJobs

Section 6: Configuration for Kubernetes Objects

- Configuration Decoupling
- Managing Configurations: ConfigMaps
- Managing Sensitive Information: Secrets
- Security Considerations

Section 7: Scheduling in Kubernetes

- The Scheduling Process
- Basic Node Selection
- Affinity and Anti-Affinity Rules
- Taints and Tolerations

Section 8: Resource Usage Control and Quality of Service (QoS)

- Resources in Kubernetes
- Resources, Scheduling, and Quality of Service (QoS)
- Controlling Defaults and Boundaries

Section 9: Scaling in Kubernetes

- Horizontal Workload Scaling in Kubernetes
- Vertical Workload Scaling in Kubernetes
- Scale an RKE2 Kubernetes Cluster

Section 10: Cluster Networking and Services in Kubernetes

- The Kubernetes Networking Model
- Services in Kubernetes
- External Service Exposure (Ingress and Gateway API)

Section 11: Storage in Kubernetes

- The Need for Persistent Storage
- Storage Abstractions
- Provision Storage
- The Container Storage Interface (CSI)

Section 12: Security in Kubernetes

- Kubernetes Security: A Multi-layered approach
- API Access Control
- Network Segmentation with NetworkPolicies
- Other Kubernetes Key Security Features

Section 13: Monitoring and Troubleshooting in Kubernetes

- Troubleshooting and Monitoring Tools
- Diagnosing Application Issues
- Cluster Issues
- Networking and Service Troubleshooting

Section 14: Cluster Operations in Kubernetes

- Node Lifecycle Management
- Cluster Upgrades
- Backups and Disaster Recovery

Section 15: Kubernetes Application Management with Helm

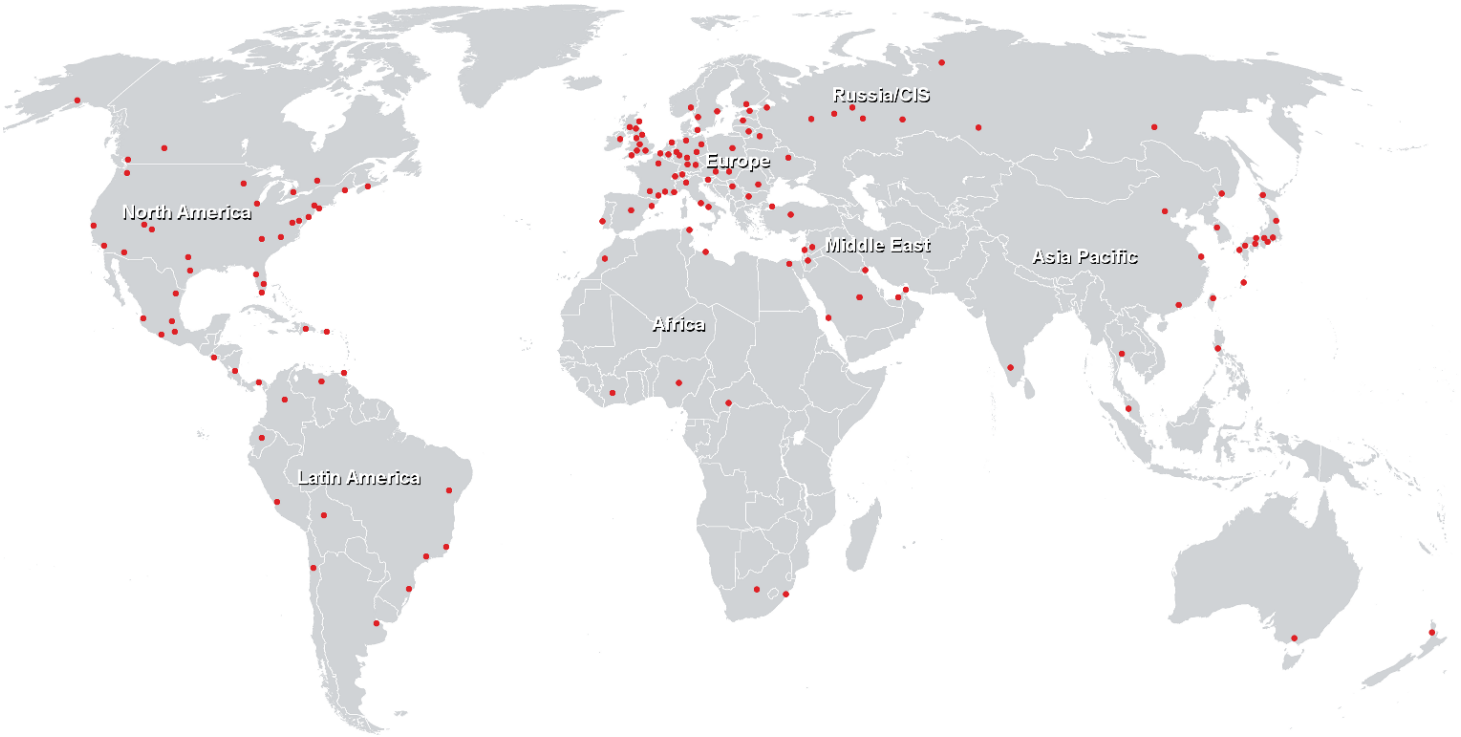
- Helm Charts and Repositories
- Release management (Install, Upgrade, Rollback)

Section 16: Extending Kubernetes using Operators and Customer Resource Definitions (CRDs)

- The Need for Extensibility
- Extending the Kubernetes API: (CRDs)
- Kubernetes controllers and Operators

Kubernetes Administration with RKE2 (RKE201V2)

Training Centres worldwide



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