

Kubernetes Administration



Delivery: Instructor-led-training (ILT)

Duration: 2 days

Course Description

Learn about the basic administration tasks of managing a Kubernetes cluster. Use the `kubectl` and `kubeadm` command-line tools and an integrated development environment (IDE) to provision cluster and network resources. Explain the configuration and deployment of basic workload objects and common Kubernetes cluster tasks. This course was written for the Kubernetes 1.29 release.

Role

Systems administrator, architect, and integration engineer

Prerequisites

Basic Linux administration skills

Objectives

This course focuses on enabling you to do the following:

- Describe a Kubernetes cluster
- Discuss creating basic pod configuration
- Investigate the Kubernetes scheduling
- Manage workloads deployed in Kubernetes
- Discuss the internal pod network in Kubernetes
- Review monitoring tools for Kubernetes
- Configure role-based access control (RBAC) for a Kubernetes cluster

Course Content

This course includes the following modules, lessons, and exercises:

Module	Lessons	Exercises
Module 1: Introduction	<ul style="list-style-type: none">• Kubernetes overview• Kubernetes interfaces	Setting up your environment
Module 2: Pod administration	<ul style="list-style-type: none">• YAML• Pods and containers• Namespaces• Configuration• Multicontainer pods• Services• Creating and updating configurations	Managing pods and services
Module 3: Scheduler	<ul style="list-style-type: none">• Basic scheduling• Influencing the scheduler• Static pods	Scheduling pods
Module 4: Workloads	<ul style="list-style-type: none">• ReplicaSets• Deployments• DaemonSets• StatefulSets• Jobs and CronJobs	Managing workloads
Module 5: Networking	<ul style="list-style-type: none">• Cluster networking• Pod networking• Container Network Interface• Service networking• DNS• Network policies	Working with networking
Module 6: Monitoring and logging	<ul style="list-style-type: none">• Debugging through logging• Enterprise logging• Monitoring Kubernetes• Performance monitoring• Autoscaling with monitoring• State monitoring	Exploring monitoring and debugging

Module	Lessons	Exercises
Module 7: Role-based access control	<ul style="list-style-type: none"> • Authentication • User authentication • Service account authentication • Authorization • Pod permissions • Container image access 	Working with role-based access control
Module 8: Next steps	<ul style="list-style-type: none"> • Next steps 	None
Appendix 1: Kubernetes-related certifications	<ul style="list-style-type: none"> • Cloud Native Computing Foundation exams • NetApp Kubernetes-related exams 	None
Appendix 2: Installation and maintenance	<ul style="list-style-type: none"> • Cluster installation overview • Kubernetes installation: The hard way (highlights only) • Kubernetes installation: Kubeadm • Cluster maintenance 	Upgrading a Kubernetes cluster
Appendix 3: Advanced monitoring techniques	<ul style="list-style-type: none"> • Available options for monitoring Kubernetes • Monitoring with Prometheus and Grafana 	Monitoring with Prometheus and Grafana
Appendix 4: Introduction to containers	<ul style="list-style-type: none"> • Modern software evolution • Containers • Container run-time engines • Container orchestrations 	Working with a Container Runtime Engine (CRE)
Appendix 5: Architecture components	<ul style="list-style-type: none"> • Control Plane components • Pod components • Component interactions 	Exploring the Control Plane components
Appendix 6: Ingresses	<ul style="list-style-type: none"> • Ingress introduction • Ingress example 	Working with an ingress
Appendix 7: Helm	<ul style="list-style-type: none"> • Helm introduction • Helm charts 	None

Course ID: STRSW-ILT-KA
20MAY24