

Certified Kubernetes Security Specialist (CKS)

This intermediate Certified Kubernetes Security Specialist (CKS) training prepares DevOps professionals to take the CKS exam, which is the one exam needed to learn the Kubernetes Security Specialist certification. After finishing this Kubernetes training, you'll know how to minimize microservice vulnerabilities and set up and harden Kubernetes clusters.

[CBT Nuggets course material](#) →

WEEK 1

Intro to Certified Kubernetes Security (CKS)

156 min.

Overview of Kubernetes Certifications	10
Kubernetes Cluster and Node Hardening	12
Secure Microservices with Service Mesh and Policy	11
Discuss Software Supply Chain Security	12
Kubernetes Monitoring and Runtime Security	9

Intro to Network Policy for Kubernetes

Overview	1
Learn Network Policy Security Concepts in Kubernetes	8
Block Network Traffic by Source CIDR Block	8
Apply Pod Selectors to Kubernetes Network Policy	6
Select Network Traffic by Source Namespace	7
Apply Egress Rules to Kubernetes Network Policy	9
Deploy Example Kubernetes Network Policy Scenario	8
Practice Kubernetes Network Policy	8

Limiting Access to Kubernetes GUIs

Overview	1
Intro to Securing Kubernetes GUIs	14
Secure Kubernetes GUIs with Cloud Native Firewalls	10
Encrypt Network Packets with Ingress and TLS	7
Understand Kubernetes Network Policies for Securing GUIs	6
Enable AuthN and AuthZ for Kubernetes GUI Security	7

WEEK 2

153 min.

Disable Web UIs for Improved Cluster Security 8

Using CIS Benchmark to Evaluate Kubernetes Cluster Security

Overview 1

Intro to CIS Benchmarks for Kubernetes 10

Discuss the CIS Kubernetes Benchmark Document 10

Understand Etcd and Control Plane Authentication Recommendations 11

Review Kubernetes Worker Node CIS Benchmarks 10

Learn Kubernetes Policy CIS Benchmarks 13

Securely Handling Secrets in Kubernetes Clusters

Overview 1

Intro to Kubernetes Sealed Secrets 13

Deploy Bitnami Sealed Secrets to Kubernetes Cluster 18

Encrypt Secrets with Kubeseal CLI Tool 12

Deploy and Unwrap Sealed Secret Resources on Kubernetes 6

Intro to Chaos Testing Kubernetes Clusters

Overview 1

Intro to Chaos Mesh for Kubernetes 12

Install Chaos Mesh on Kubernetes Clusters 15

Explore the Chaos Mesh Dashboard UI 9

WEEK 3

155 min.

Inject HTTP Chaos Mesh Experiment into Pods 18

Signing Container Images for Kubernetes Deployment

Overview 1

Intro to Signing Container Images 12

Understanding Sigstore Cosign CLI 13

Install Cosign CLI and Generate Key Pair 14

Build and Digitally Sign Container Image with Cosign 15

Control Network Traffic in Kubernetes with Open Service Mesh

Overview 1

Intro to Open Service Mesh for Kubernetes 9

Understand Open Service Mesh Installation Process 10

Install Open Service Mesh on Kubernetes with OSM CLI 10

Onboard Kubernetes Namespaces to Open Service Mesh 10

Verify Service Connectivity from OSM Client Pod 7

Limit Network Connectivity with OSM IngressBackend Resource 13

Securely Store Secrets in Kubernetes with Vault

Overview 1

Intro to Hashicorp Vault on Kubernetes 8

Understanding Hashicorp Vault Architecture on Kubernetes 10

WEEK 4

151 min.

Install Hashicorp Vault on Kubernetes with Helm 12

Initialize and Unseal Hashicorp Vault and Create Secret 10

Create Vault Permissions Policy and Role 9

Inject Hashicorp Vault Secrets into Kubernetes Pod 12

Implement Pod Security Policies in Kubernetes

Overview 1

Intro to Pod Security Policies 10

Learn Pod Security Policy Architecture 9

Test Default Behavior of Kubernetes PSPs 13

Create Kubernetes Service Account and Pod Security Policy 7

Create Role and Validate PSP Behavior 10

Understanding Kubernetes Admission Controllers

Overview 1

Intro to Kubernetes Admission Controllers 14

Learn About Dynamic Admission Controllers 10

Examine Built-in Kubernetes Admission Controllers 14

Customize Kubernetes (k3s) API Server Admission Plugins 15

Master Auditing in Kubernetes Clusters

Overview 1

WEEK 5

162 min.

Intro to Auditing in Kubernetes 14

Understanding Kubernetes Audit Policy Configuration 14

Install K3S and Enable Audit Logging 13

Enable Kubernetes Audit Backend 10

Working with Kubernetes Events

Overview 1

Intro to Kubernetes Event Resources 17

Explore Kubernetes Event Schema 11

Understand Node Level Events in Kubernetes 6

Explore Pod Events in Kubernetes 9

Filter Kubernetes Events with Kubectl CLI 10

Process Kubernetes Audit Logs with PowerShell

Overview 1

Intro to Processing Kubernetes Audit Logs 11

Provision Kubernetes Audit Database with MySQL 12

Connect to MySQL Database from PowerShell and VSCode 14

Parse Kubernetes JSON Audit Logs and Insert MySQL Records 17

WEEK 6

Validate Container Image Signatures in Kubernetes 62 min.

Overview 1

Intro to Container Image Verification in Kubernetes 18

Customize Connaisseur Helm Variables 11

Install Connaisseur Helm Chart 7

Build and Test Signed Container Image 18

Scan Linux Container Images for Vulnerabilities with Trivy

Overview 1

Intro to Container Image Vulnerability Scanning Tools 10

Explore Trivy Scanner Functionality	11
Deep Dive Into Trivy Vulnerability Data Sources	13
Run Trivy Vulnerability Scan on Linux VM	17

Detect Runtime Security Threats with Falco

Overview	1
Intro to Falco Open Source Event Detection	11
Learn About Falco Sidekick Utility	9
Engage with the Falco Development Community	9
Install Falco on Linux Virtual Machine	10
Review Falco Configuration Files and Launch Falco	12

WEEK 7

Secure Kubernetes Access with Teleport 160 min.

Overview	1
Intro to Teleport Proxy Security for Kubernetes	7
Understanding Teleport Architecture on Kubernetes	9
Install Teleport Proxy on Kubernetes Cluster	11
Configure Teleport DNS Endpoint and User	14
Login to Kubernetes Cluster via Teleport CLI	13

Enforce Kubernetes Resource Configuration with Kyverno Policies

Overview	1
Intro to Kyverno Policy Management for Kubernetes	16
Install Kyverno on Kubernetes Cluster with Helm	15
Examine Kyverno Policy Library and Network Policy	10
Apply Kyverno Policy to Enforce Kubernetes Quotas	7

Monitoring Kubernetes with Sumo Logic

Overview	1
Intro to Kubernetes Monitoring with Sumo Logic	10
Install Sumo Logic Helm Chart on Kubernetes Cluster	11
Explore Sumo Logic Open Source Components	10
Explore Built-in Kubernetes Dashboards in Sumo Logic	10
Understanding Kubernetes E-mail Alerts in Sumo Logic	11

WEEK 8

Understanding Dynamic Admission Controllers for Kubernetes 158 min.

Overview	1
Intro to Kubernetes Dynamic Admission Controllers	8
Learn Basic Structure of Validating Webhook Configuration	8
Understanding Kubernetes Webhook Configuration Rules	9
Setting the Client Config for Kubernetes Webhook Configs	7
Understanding Extra Webhook Config Options	6
Inspect Validating Webhook Config Requests	12

Automate Container Image Scanning in GitHub Actions

Overview	1
Intro to Container Image Scanning with GitHub Actions	14
Create Simple GitHub Actions Project	6
Install and Run Trivy in GitHub Actions	17
Abort GitHub Actions Workflow on Detected Vulnerabilities	6

Improve Trivy Performance in GitHub Actions 15

Explore Chaos Mesh Experiments for Kubernetes Clusters

Overview 1

Schedule Chaos Mesh Experiments with Cron Expressions 20

Develop Complex Chaos Mesh Workflows 16

Inject Stress Chaos into Kubernetes Pods 8

WEEK 9

157 min.

Perform Kubernetes Network Attacks with Chaos Mesh 11

Implement Pod Security Standards in Kubernetes

Overview 1

Intro to Pod Security Standards 16

Implement Warning for Baseline Pod Security Standard on Namespace 18

Enforce Baseline Pod Security Standard Versions 12

Apply Pod Security Standard to Entire Kubernetes Cluster 12

Control Kubernetes API Priority and Fairness

Overview 1

Intro to Kubernetes API Priority and Fairness 9

Understanding API Priority & Fairness Resources 8

Examine Kubernetes FlowSchema Resource Type 11

Validate FlowSchema Applied During k8s API Requests 11

Explore Kubernetes Priority Level Configuration Queues 10

Validate Kubernetes Infrastructure with PowerShell Pester Tests

Overview 1

Intro to Kubernetes Infrastructure Testing with Pester 8

Discuss Specific Use Cases for Automated Kubernetes Testing 8

Setting Up PowerShell and Pester Dev Environment 6

Write Pester Test for Kubernetes Pods in Default Namespace 11

WEEK 10

158 min.

Write Pester Test for Kubernetes Deployment Replica Count 9

Add Pester Template Strings to Test Cases 7

Write Pester Test for Kubernetes Cluster Role Bindings 10

Understanding Open Policy Agent

Overview 1

What's Driving the Need for Policy? 8

Intro to Open Policy Agent (OPA) Concepts 10

Understand OPA Gatekeeper Architecture with Kubernetes 10

Install OPA Gatekeeper on Kubernetes Cluster 8

Deploy OPA Constraints to Kubernetes Cluster 10

Remediate Audit Violations from OPA Gatekeeper 10

Validate Kubernetes Resource Configurations with Datree

Overview 1

Intro to Kubernetes Resource Validation with Datree 11

Run Datree CLI Against Local Kubernetes Manifest	10
Skip Datree Policy Rules with Resource Annotations	10
Evaluate Datree Policy Rules on Live Kubernetes Resources	13
Configure Datree Policies Centrally or Locally	9

Develop Rego Policies for Open Policy Agent

Overview	1
Intro to Rego for Open Policy Agent (OPA)	8
Create Rego Policy and Parse with OPA CLI	9

WEEK 11

36 min.

Write Rego Policy Tests and Execute with OPA CLI	8
Pass Inputs to Rego Policies and Use String Functions	9
Evaluate Rego Policy Return Values	9
Implement Time Window Policy in Rego	9