

# CKS Exam Simulator 2026

A comprehensive practice lab for the **Certified Kubernetes Security Specialist (CKS)** exam, featuring 14 real-world security scenarios.

## 🎯 Overview

This simulator provides hands-on practice questions covering all CKS exam domains:

Domain	Weight	Questions
Cluster Setup	15%	Q02, Q03, Q05, Q07
Cluster Hardening	15%	Q02, Q08, Q13
System Hardening	15%	Q06
Minimize Microservice Vulnerabilities	20%	Q11
Supply Chain Security	20%	Q04, Q10, Q12
Monitoring, Logging & Runtime Security	20%	Q01, Q09, Q14

## 🚀 Getting Started

### Prerequisites

- A Kubernetes cluster (kind, minikube, or real cluster) - **Kubernetes v1.30+**
- `kubectl` configured and working
- Root/sudo access for some questions
- Tools (for specific questions):
  - `falco` - Runtime security monitoring
  - `bom` or `syft` - SBOM generation
  - `trivy` - Image scanning
  - `kube-bench` - CIS benchmarks

### Quick Start

```
# Make scripts executable
chmod +x scripts/run-question.sh
find . -name '*.sh' -exec chmod +x {} \;

# List all questions
./scripts/run-question.sh list

# Setup a specific question
./scripts/run-question.sh 1

# Work on the question...
```

```
# Verify your solution  
./scripts/run-question.sh 1 verify  
  
# Need help? Show the solution  
./scripts/run-question.sh 1 solution  
  
# Reset and try again  
./scripts/run-question.sh 1 reset
```

## Commands

Command	Description
list	List all available questions
setup <N>	Setup environment for question N (default)
verify <N>	Verify your solution
solution <N>	Display the solution
reset <N>	Reset the environment
question <N>	Display question text only
exam	Start full exam simulation (2 hours)

## Questions

### Question 01 - Falco Runtime Security (7%)

Identify and stop a pod accessing `/dev/mem` using Falco runtime detection.

### Question 02 - Worker Node Upgrade (5%)

Upgrade a worker node from Kubernetes 1.34.0 to 1.34.1.

### Question 03 - Ingress with TLS (5%)

Configure an Ingress with TLS termination and HTTP to HTTPS redirect.

### Question 04 - SBOM Generation (4%)

Generate a Software Bill of Materials in SPDX format.

### Question 05 - TLS Secret (2%)

Create a TLS secret from certificate and key files.

### Question 06 - Docker Daemon Hardening (5%)

Secure Docker daemon configuration on a cluster node.

## Question 07 - Network Policy (7%)

Create NetworkPolicies to deny all ingress and allow specific traffic.

## Question 08 - ServiceAccount Token (5%)

Configure projected volume for ServiceAccount token mounting.

## Question 09 - Kubernetes Auditing (7%)

Configure kube-apiserver audit logging with custom policy.

## Question 10 - ImagePolicyWebhook (7%)

Setup ImagePolicyWebhook admission controller.

## Question 11 - Pod Security Admission (7%)

Identify and delete pods violating PSA restricted policy.

## Question 12 - Dockerfile Security (7%)

Fix security issues in Dockerfile and Deployment manifest.

## Question 13 - Kubelet Security (5%)

Harden kubelet configuration on a worker node.

## Question 14 - Container Immutability (7%)

Configure read-only root filesystem with emptyDir for writable paths.

## 📁 Directory Structure

```
cks-real-exam-questions/
├── scripts/
│   └── run-question.sh      # Main runner script
├── Question-01-Falco/
│   ├── question.txt        # Question description
│   ├── setup.sh            # Environment setup
│   ├── verify.sh           # Solution verification
│   ├── solution.sh         # Step-by-step solution
│   └── reset.sh            # Cleanup
├── Question-02-Upgrade/
│   └── ...
├── Question-03-IngressTLS/
│   └── ...
└── ... (14 questions total)
└── README.md
```

## 💡 Tips for the CKS Exam

## Time Management

- 2 hours for ~15-20 questions
- Average 6-8 minutes per question
- Don't get stuck - flag and move on

## Key Resources

- [Kubernetes Documentation](#)
- Use `kubectl explain` for quick reference
- Bookmark important pages

## Common Patterns

```
# Quick pod with curl for testing
kubectl run test --image=curlimages/curl --rm -it -- curl <service>

# Export resource to YAML
kubectl get deployment <name> -o yaml > deployment.yaml

# Check API server logs
kubectl logs -n kube-system kube-apiserver-<node>

# Verify cluster health
kubectl get nodes
kubectl get pods -A
```

## Security Contexts Cheat Sheet

```
securityContext:
  runAsNonRoot: true
  runAsUser: 1000
  allowPrivilegeEscalation: false
  readOnlyRootFilesystem: true
  capabilities:
    drop: ["ALL"]
```

## Troubleshooting

### API Server Won't Start

```
# Check static pod logs
sudo cat /var/log/pods/kube-system_kube-apiserver-*/kube-apiserver/*.log

# Restore from backup
sudo cp /etc/kubernetes/manifests/kube-apiserver.yaml.bak
/etc/kubernetes/manifests/kube-apiserver.yaml
```

## Kubelet Issues

```
# Check kubelet status  
sudo systemctl status kubelet  
  
# View kubelet logs  
sudo journalctl -u kubelet -f
```

## Reset Everything

```
# Reset all questions  
for dir in Question-*; do  
    bash "$dir/reset.sh" 2>/dev/null || true  
done
```

## License

This project is for educational purposes. Good luck with your CKS exam! 🎉

## Contributing

Feel free to submit issues and enhancement requests!

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**Author:** CKS Exam Preparation

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