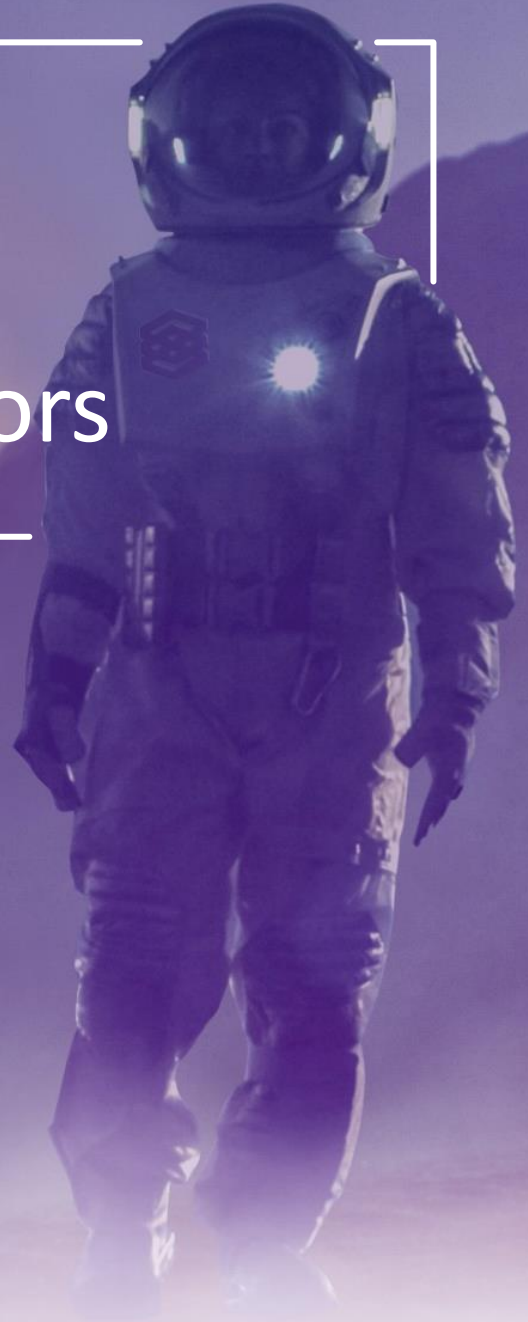





FULLSTACK

Kubernetes Training For Administrators



Kubernetes for Administrators

 4-day training

This training course is specifically designed for those who already have hands-on experience with Kubernetes and want to explore its deepest depths. You'll learn how to iterate faster and more safely.

The Kubernetes for Administrators course covers subjects such as deployment strategies, configuration, Pods, Services and Ingress. Just to name a few.

All talk, no action? Definitely not. We need you to bring your A-game to the Kubernetes for Developers training. Through hands-on workshops, we'll have you containerize and deploy applications to a Kubernetes cluster and iteratively improve it. Our trainers will put you to work! Pick their brain while you're at it: they are true experts and happy to share their first-hand experiences and war stories.



QUICK FACTS



For Who

Anyone who knows the basics of Kubernetes. Participants typically include Business, DevOps, and Operations people.



Requirements

You should be familiar with modern applications and understand how to execute and test source code on your own machine. Docker experience is a bonus.



Time Investment

The complete course takes 4 full days. It's possible to split it up over multiple days.



Pricing

Get in touch.

What You'll Learn

- All your options when working with containers
- The role of core Kubernetes resources (Pod, Deployment, Service, Ingress)
- Using Kubernetes to pass configuration and secrets to running applications
- How to use Kubernetes startup and shutdown features to ensure that apps are initialized in a stable environment and are shut down gracefully
- Security considerations in cloud-native apps and recommended tools to minimize risk
- Identify performance bottlenecks by using tracing to visualize requests from the end-user
- Effective debugging strategies for identifying and fixing outages caused by application bugs

What to Expect

After completing the Kubernetes for Developers course, you'll confidently containerize, deploy, and configure applications. If you want to take the CKAD exam, this training is the perfect preparation for it.

Day 1

Container Refresh


 2 hours

Because we need to really understand containers before we start using Kubernetes. We go into why containers came to be, what problems they fix and which they bring. The goal here is to really understand the options you have when working with containers. These are the building blocks of everything else that follows in this course.

Topics: What containers add to a system | What issues they fix | What issues they bring | Why we still like them | Builds and multistage builds | Live demo: explain layers | Environment variables | Volume mounting | Container best practices (security and keeping up to date)

Workshops: Build a container with provided app | Play with layers | Push a container

What is a pod?

 2 hours

Now that we know containers, let's have a look at what a pod is. How does it differ from a regular container and what benefits does it add? What options do we have to manage its health? In this section we start using the kubectl command as well.

Topics: Kubectl command 101, labels, get -o yaml, get, describe, edit, exec | The Pod yaml spec | What options do we have when running a pod? – Not touching configmaps or secrets yet, nor storage – Health checks are also for later | Namespaces

Workshops: Build a pod | Edit the pod | Delete the pod | Recreate the pod

Pod Controllers

 2 -3 hours

Now that you know what a pod is, you can forget about ever managing them directly. There are much better tools available for pod management. In this section we go in to all the pod controllers that you will need to know about.

Topics: Daemonsets | Deployments | Statefulsets | Replicasets

Workshops: Replicasets hands on | Deployments 101 | Statefulsets in practice | Daemonsets for the edge cases

Day 2

Kubernetes internal

 1 hour

CKA focusses on managing kubernetes clusters. In this section we go into the kubernetes ecosystem and explore everything it takes to be a kubernetes cluster.

Topics: Kubernetes layout diagram | Control plane components | Node components | Cloud provider component

Creating a cluster

 2 - 3 hours

Now that we know what components exist in a Kubernetes cluster. Lets go ahead and build one ourselves! In this section we will use kubeadm to install a kubernetes cluster in our linux environment.

Topics: Installing Kubernetes dependencies such as the container runtime | Installing Kubernetes | Bootstrapping a cluster

Workshops: Build a cluster | Install a CNI | Add an additional Node | Access cluster

Managing a cluster

 3 hours

Basic node adding and creating a cluster is cool. But how do you troubleshoot? How do you make backups? How do you safely replace a node? In this section we take what we learned so far, and learn the day 2 skills needed for when things break.

Topics: Create a backup of your cluster | Safely remove a Node | Upgrading a cluster

Workshops: Backup etcd to your filesystem | Restore cluster from your etcd? | Tainting nodes. | Node lifecycle, safely delete and replace a node. | Troubleshoot broken cluster (maybe 2 broken clusters) | Fix node not ready

Day 3

Services and Ingress


 1 hour

We have built a cluster and managed its nodes not. We ran some deployments so we know the main goal that kubernetes serves us. Easy infrastructure management, with declarative workload management. But how do we make our applications available to the outside world?

Topics: What are we trying to achieve by exposing our applications? | Why do we not care about IP addresses anymore? | What is safe?

Workshops: Explore different Service options at our disposal. | Use the ingress available to expose http endpoints without exposing the infrastructure behind it.

Configuration


 2 hours

One of the major concepts of the CKA exam is having great control of the configuration options at your disposal. Not even just at the exam but after that it is important to know how you can use the configuration options to safely and securely manage your workloads.

Topics: Configuration as a configmap or secret. | What are the differences?

Workshops: handful of hands on configmap and secret tasks that will prepare for the exam.

Making your applications robust!

 2 hours

Now that we know how to configure our application, how to deploy it and how to expose it we should look into letting kubernetes manage your application even better.

Topics: Healthprobes | Resource limits and requests | Metrics server and HPA to enable autoscaling!

Workshops: Make a failing container auto-heal (possibly, depends on container build difficulty) | Automatically scale based on application load.

Day 4

Storage options

 2 hours

Every kubernetes admin runs into the big question at some point. How do we do persistent storage? How do I share storage between two processes? In this section we dive into the storage options and how you need to be able to use them for your benefit.

Topics: Create PV's | Claim PV's | Manage ephemeral storage

Workshops: Share a volume between two containers in the same pod. | Build a manual pv and use in a pod.

Security

 2 - 3 hours

How does kubernetes ensure the api server is secure? How does it deal with authentication and authorization?

Topics: Authentication | Authorization | Service accounts | Namespaced roles | Clusterscoped roles | NetworkPolicies

Workshops: Allow test pod to read all nodes but not update | Allow test pod to read pods in namespace b, but not c | Allow test pod access to configmaps in all namespaces | Allow pod access networkpolicy (if time permits)

Custom Controllers

 1 hour

Every single cluster will have at least one custom controller running. This is because kubernetes exposes a very easy way to get all the flexibility of Kubernetes for your own resources. But what does that mean? And how does it work?

Topics: Examples of custom controllers to give some context: external DNS - Cert Manager | What does a controller actually do | What does a CRD mean for our cluster? | Bonus: quick tip to kubebuilder and operatorsdk should you ever want to get started. | Possibly live demo

Kubernetes deployment strategies

 1 hour

We have seen how to manage everything we need inside a cluster, even how to extend it with our own extra resources. But we hate manual work, that is the whole shtick of kubernetes. So lets talk deployment strategies, options you have at your disposal and do a quick overview of how the two major ones differ.

Topics: Helm intro | Kustomize intro - IF time permits, gitops intro

Workshops: Use helm to deploy application. | Use kustomize to deploy application.

Round up

After all this, you probably have some questions. Let's discuss them and answer any final questions regarding taking the exam for CKA!



FULLSTAQ



Why You Should Trust Us to Take YOU to the Next Level

Fullstaq is a Kubernetes Certified Service Provider (KSCP), and we have years of experience helping our customers successfully implement and adopt Kubernetes. That means your teachers are highly-qualified experts who know first-hand what Kubernetes entails. They've been around the block and are excited to share their hands-on knowledge and learnings.