Kubernetes training agenda

The detailed agenda and list of topics to cover is adapted for every client before the training. If you want to focus on something specific, or skip some topics, please let us know.

The training is divided into four modules, each around half day long. We need two days to cover the full material, but if you want to have a one day training we're happy to discuss your needs and prepare a tailored one-day training.

Training materials are in English. Training is conducted in Polish or English depending on the preference.

Module 1: Kubernetes Basics

Kubernetes basics:

- Introduction to Docker and containers
- Introduction to Kubernetes
- Pods, Deployments and Services: cluster building blocks
- Warm-up exercise

Kubernetes architecture:

- Kubernetes components
- kube-apiserver
- etcd
- kubelet
- Other components
- Kubernetes components exercise

Module 2: Application Lifecycle

Programming stage

- General remarks
- Source security scanners

Build phase security

- Docker image leaks
- Build secrets
- Minimal images
- Multi-stage builds
- CI&CD
- Image scanners and linters
- Practical exercise

Deploy phase security

- Image signing
- Git-ops (flux, argocd)
- Schema linters
- Pod security standards
- Namespaces

- Secret management
- Practical exercise

Runtime phase security

- Service tokens
- Root user
- Practical exercise

Module 3: Administration, configuration, access control

Kubernetes access control:

- Kubernetes API refresher
- Authentication
- Authorization
- Admission control
- Admission webhook exercise
- Automount token abuse exercise

Kubernetes networking:

- Pod-to-pod network model
- Network policies - cluster-level firewall
- Network policy exercise
- Cloud metadata API
- Service meshes (with Consul)
- Service mesh exercise

Service audit and monitoring:

- Built-in audit engine
- API server audit
- Audit tools

Module 4: Low level aspects of container security

Docker internals:

- Runc and containerd
- CRI-o

Container internals:

- Linux capabilities (with exercise)
- Seccomp (with exercise)
- Cgroups (with exercise)
- Linux namespaces (with exercise)
- LKRG, SELinux and AppArmor
- Exercise: privileged container breakout