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Hardening Kubernetes Clusters

Reducing Attack Surface in Kubernetes by means of Rootless Containers, Network Policies and Role Based Access Control

Bachelor Thesis

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Declaration of authorship:

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Abstract

(E.g. “This thesis investigates...”)

Kurzfassung

(Z.B. “Diese Arbeit untersucht...”)

List of Abbreviations

ARP	Address Resolution Protocol
GPRS	General Packet Radio Service
GSM	Global System for Mobile communication
WLAN	Wireless Local Area Network

Key Terms

GSM

Mobilfunk

Zugriffsverfahren

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3 Literature Review

The purpose of this literature review is to explore the security threat landscape of Kubernetes environments. Specifically, recurring concepts and common denominators across vulnerabilities shall be identified and discussed. For this, the database of Common Vulnerabilities and Exposures (CVE), the IEEE database, the ACM digital library and the official Kubernetes feed of CVEs are queried using keywords pertaining to Container and Kubernetes Security. The acquired papers, articles and CVE descriptions are skimmed through. the most relevant results are narrowed down and selected for closer inspection. It shall be noted that Kubernetes vulnerabilities do not only entail standard Kubernetes components, but also add-ons deployed on top of 'plain' Kubernetes. Such can be the Nginx Ingress-Controller, a Service-Mesh, CI/CD tools closely embedded into Kubernetes and more. Generally, this can be anything that extends the Kubernetes API through Custom Resource Definitions (CRDs).

According to RedHat's report on the state of Kubernetes security in 2022, ... yes hello

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