

CONTAINERS & DOCKER SECURITY

Unit 1 Application Containerization

Understanding Containers, Challenges in the Software Industry, Problems in Software Industry Before Containers, Put that in Container! Solution by containers in the Software Industry, Virtualization, Hypervisor, Scope of Virtualization, Containers vs Virtual Machines, Understanding Containers, Containerisation Platform, Runtime and Images, Container Platform, Container Runtime, The Chroot System, FreeBSD Jails, Linux Containers (LXC), Docker

Unit 2 Introduction to Containerization and different environments

Docker architecture, Docker Daemon (Container Platform), Docker Rest API, Understanding Different environments: (Dev, QA and Prod), Overcoming issues with different environments, Development Environment, Testing Environment, Staging Environment, Production Environment, Virtual machines for dev/deployments, Containers for dev/deployments, Advantages and drawbacks of containerization

Unit 3 Docker Fundamentals and Internals

Docker container states, docker image vs docker containers, docker image creation using docker commit & dockerfile, dockerfile important keywords, docker tags, persistent storage use-case, docker volumes, docker networks, creating custom networks in docker, docker registry, docker inbuilt security concepts (namespaces, cgroups)

Unit 4 Orchestration Tools

What is orchestration, Need of orchestration, Case study: Need of Orchestration , Need of Orchestration: Container and Microservices, Docker Swarm and Kubernetes, Architecture, AWS (ECS,EKS), AWS Elastic Container Services Architecture, Azure Kubernetes Services, OpenShift, KUBERNETES ON CLOUD, Monitoring of container, How to monitor

Unit 5 Container Security

Docker vs Vagrant, Docker Challenges Revisited, Vulnerabilities in images (Public and Private), Denial of service attacks, Privilege escalation methods in Docker, Security misconfigurations, Container Security, Content Trust and Integrity checks, Capabilities and namespaces in Docker, Segregating Networks, Kernel Hardening using SecComp and AppArmor, Static Analysis of container(Docker) images, Dynamic Analysis of container hosts and daemons.