

Course Outline:

CN100: Docker Containerization Essentials

- Containerization motivations and implementation
 - Usecases
 - Comparison to virtual machines
- Creating, managing and auditing containers
 - Container implementation from the Linux kernel
 - Container lifecycle details
 - Core container creation, auditing and management CLI
- Best practices in container image design
 - Layered filesystem implementation and performance implications
 - Creating images with Dockerfiles
 - Optimising image builds with multi-stage builds and image design best practices
- Single-host container networking
 - Docker native networking model
 - Software defined networks for containers
 - Docker-native single-host service discovery and routing
- Provisioning external storage
 - Docker volume creation and management

- Best practices and usecases for container-external storage.

CN120: Kubernetes Application Essentials

- Make effective use of pod architecture
- Deploy workloads as Kubernetes controllers
- Provision configuration at runtime to Kubernetes workloads
- Network pods together across a cluster using native services
- Provision highly available storage to Kubernetes workloads
- Package an application as a Helm chart

CN230: Kubernetes Native Application Development

- Container Development Environments
 - Rapid development with code mounts and automatic reloading
 - Attaching debuggers to containerized processes
 - Installing Kubernetes development environments
- Container Lifecycle
 - Optimizing image design to take advantage of the container lifecycle
 - Runtime operations to avoid or mitigate
 - Implementing logging, resource management and healthchecks for containers
 - Handling container exit

- Introduction to developer-driven operational control
- Containerizing Applications
 - Migrating preexisting applications from VMs to containers
 - Refactoring applications for microservices
 - Hybrid applications (containerized + uncontainerized)
- Container Health & Monitoring
 - Implementing container healthchecks with Kubernetes
 - Integrating Prometheus monitoring with Kube applications
- Introduction to Containerized Continuous Integration
 - Differences between traditional and containerized continuous integration
 - Tooling choices for CI chain components
 - Recommended CI chain architecture
- CI Agent Deployment
 - Designing access control patterns for CI agents
 - Installing and integrating Jenkins with Kubernetes
- Building Images in CI
 - Implementing build environments
 - Designing reusable image hierarchies
- Testing in CI
 - Unit and integration testing in containers

- Testing pipeline design
 - Integrating security scanning in a testing pipeline
- Releasing Containerized Applications
 - Signing images with content trust
 - Packaging applications with Helm