



**Xerkez Solutions**  
**Cooperate Training Road Map**  
**On**

**RedHat OpenShift ML Accelerator Transformative Training**  
(Full Stack AI Development + Openshift Cluster + DevSecOps)

This course provides an in-depth understanding of deploying, managing, and scaling Artificial Intelligence and Machine Learning (AIML) applications on **OpenShift**, a container orchestration platform. Students will learn how to containerize AIML applications, deploy them on **OpenShift**, integrate them with other services, and scale them as needed.

**Prerequisite:**

- Understanding of Python Programming, Git and GitHub.
- Basic understanding of Machine Learning and Algorithms.
- Basic understanding of cloud computing concepts.
- Basic command line skills and Linux Commands
- Basic of Django and Flask to design front end.
- Laptop with Internet

**Course Objectives:**

- Understand the concepts of containerization and container orchestration.
- Learn how to containerize AIML applications using Docker and Docker Compose.
- Gain Proficiency in deploying AIML applications on OpenShift.
- Explore strategies for managing and scaling AIML applications on OpenShift.
- Integrate AIML applications with other services on OpenShift.
- Develop skills in monitoring and troubleshooting AIML applications on OpenShift.
- Authentication and Authorization, Network – Container – Image Security, Secret Management, Updates and Patch Management, Incident Response and Forensic.

Local setup (Physical Mode)	General Requirement	Cloud Account
Laptop/Desktop with high-speed internet connection, Windows 10 and above	64-bit kernel and CPU support for virtualization.	Amazon Web Service (AWS) For ROSA Environment
Memory: 16 GB RAM	Graphics Card	
CPU: 4 CPU Cores	Visual Studio,	
Storage: 100 GB	Git/GitHub Account	

### Delivery Format:

- Instructor-led sessions (Online & Offline)
- Hands-on labs and exercises
- Q&A sessions
- Assignment and projects

### Topics Covered:

#### 1. Introduction to AIML and OpenShift

- Overview of Artificial Intelligence and Machine Learning
- Introduction to OpenShift and Container Orchestration
- Benefits of deploying AIML applications on OpenShift
- Architecture of OpenShift Development on AWS
- Introduction to ROSA – Web Console and CLI Tools
- Installing a Cluster Quickly on AWS, Upgrading and Configuring Clusters

### Hands-on:

**Lab No. 1:** To deploy a Red Hat OpenShift Services on AWS (ROSA) Cluster

- Workshop Setup
- Developer Track
- Administrator Track
- ROSA Track
- Migrations Track
- Decision Maker Track

#### 2. Containerization of AIML Applications

- Understanding Docker Containers.
- Containerizing AIML applications with Docker.
- Best practices for Dockerizing AIML applications.

- OpenShift's Source-to-Image(S2I) to build Docker Images.

### Hands-on:

## Lab No. 2: Design and Dockerize Django & Python Based Application.

### 3. Accelerate MLOps with Red Hat OpenShift

- MLOps with Red Hat OpenShift
- Build and Manage Intelligent Applications with OpenShift AI
- OpenShift AIML GitOps Integration with GitHub.
- OpenShift MLOps Templates.
- OpenShift MLOps Operators.

### Hands - on:

## Lab 3: Dockerize and Deploy Machine Learning Model as REST API Using Flask

### 4. Continuous Integration and Deployment (CI/CD) for Machine Learning

- Overview: Continuous Integrations, Continuous Delivery, Continuous Deployment
- Implementing CI/CD pipelines for ML models on **Openshift**
- CI/CD vs DevOps, CI/CD Tools.
- Automated testing and validation of ML models.
- Rolling updates and version management
- CI/CD Security – Docker Security Scanning, Security Patches
- Tools: Tekton and Argo on OpenShift

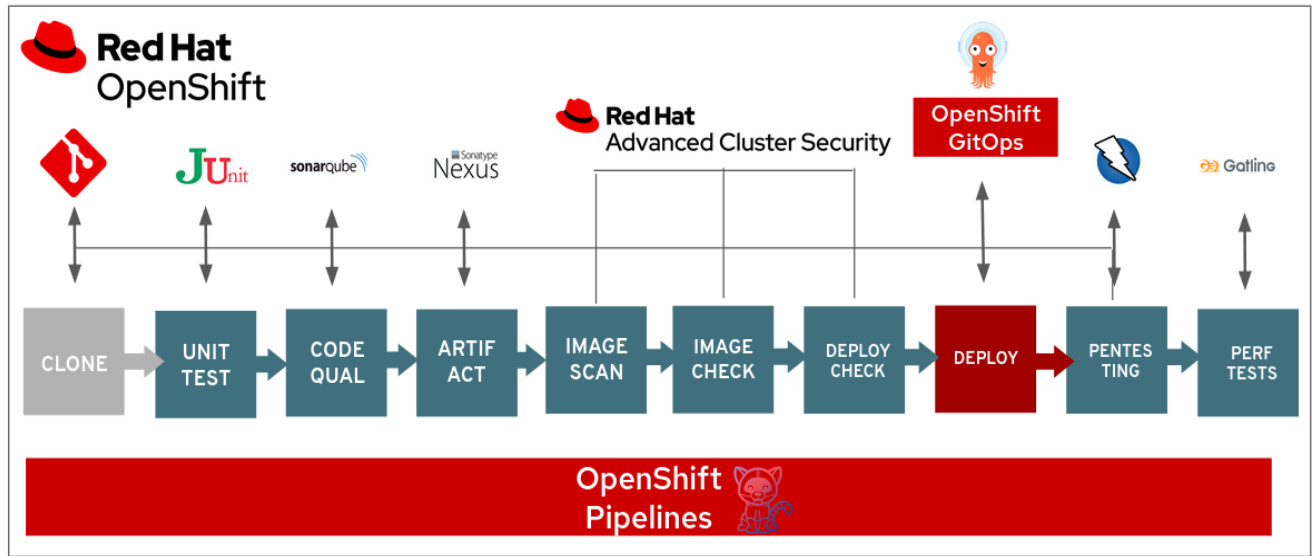
### Hands-on:

## Lab 4: CI/CD Demo with Tekton and Argo CD on OpenShift

### 5. Securing Openshift Workloads - DevSecOps

- Hardening container images.
- Implementing network policies for isolation and CI/CD pipelines.
- Access control and role-based access management (RBAC)
- Integrating security scans into CI/CD pipelines
- Automating vulnerability assessments and compliance checks
- Monitoring and logging for security insights
- Implementing runtime protection mechanisms
- Incident response and forensics in containerized environments
- Securing microservices architecture on **Openshift**

## Proposed AIML & DevSecOps Architecture



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