Argo Workshop

Learn to use ArgoCD, Argo Rollouts, Argo Workflows and Argo Events on Kubernetes

Duration	4 half days
Session Duration	4 hours/day
Level	Advanced
Modules	7

Objectives

The objective of this workshop is to equip participants who already have working knowledge of Docker and Kubernetes with the knowledge and skills needed to effectively deploy, manage and secure Kubernetes applications using Amazon EKS.

Pre Requisites

- Essentials Containers Workshop (Docker + Kubernetes) – L1 / Microservices Part 1 Workshop or equivalent knowledge. Woking knowledge on Running Containers, Building Images with Dockerfiles, Pods, Namespaces, ReplicaSets, Deployments, Services etc.
- Linux/Unix Systems Fundaments
- Familiarity with Command Line Interface (CLI)
- Fundamental knowledge of editors on linux (any one of vi/nano/emacs)
- Understanding of YAML syntax and familiarity with reading/writing basic YAML specifications

Systems Requirements

These are the prerequisites for each attendee.

Hardware Requirements

- Laptop/Desktop with High Speed Internet Connection
- Minimum of 8 GB RAM
- Minimum of 4 CPU Cores
- Recommended to have 10 GB Disk Space Available

Alternate Setup

- Laptop/Desktop with High Speed Internet Connection to connect to a remote server.
- Setup a VM / Cloud Server with linux operating system and install Docker on it. Use this as your lab environment.

Software Requirements:

- Base Operating System : Windows / Mac OSX / Linux
- Docker (choose one option)
    - Mac : Docker Desktop (https://www.docker.com/products/docker-desktop)
    - Windows : Docker Desktop (https://www.docker.com/products/docker-desktop)
    - Linux: Docker Installed with Package Manager (https://docs.docker.com/desktop/install/linux-install/)
- Additional Softwares only on Windows
    - ConEMU (Recommended)
    - Git for Windows

Topics

- Module 1 – Introduction to GitOps and ArgoCD
- Module 2 – Argo Rollouts – Configuring Progressive Delivery
- Module 3 – Automated Deployments with Argo CD

- Module 4 - Argo Workflows - Orchestrating Jobs
- Module 5 - Argo Events - Event-Driven Automation
- Module 6: Integrating Argo Tools
- Module 7 –Automated Monitoring, Experiments and Rollback

Detailed Course Outline

Module 1: Introduction to GitOps and ArgoCD

- **Topics Covered**:
    - Overview and principles of GitOps
    - ArgoCD and GitOps
    - Benefits and integration with Kubernetes
- **Hands-on/Project**:
    - Introduction to the use case / application stack
    - Setup initial Git repository for version control of course project
    - Setup Kubernetes Cluster

Module 2: Argo Rollouts – Configuring Progressive Delivery

- **Topics Covered**:
    - Progressive delivery with Blue-Green and Canary deployments
    - Rollouts Spec
- **Hands-on/Project**:
    - Set up Blue Green Deployment for a Staging Environment
    - Configure Progressive Canary Release for Prod

Module 3: Automated Deployments with Argo CD

- **Topics Covered**:
    - ArgoCD
    - Applications CRD and Spec
    - Deep dive into Sync Options, Resources Pruning etc.

- **Hands-on/Project**:
    - Configure ArgoCD with Controllers and CRDs
    - Setup Projects, Repositories and Application Deployments
    - Exploring Sync Options and Configurations

Module 4: Argo Workflows - Orchestrating Jobs

- **Topics Covered**:
    - Design and manage complex workflows
    - Integration of testing into workflows
    - Workflow Template Deep Dive – Steps, DAG, Work Templates
- **Hands-on/Project**:
    - Create workflows to set up a CI Pipeline that include building, testing, and deploying the micro services application
    - Deep dive into writing Workflow Templates

Module 5: Argo Events - Event-Driven Automation

- **Topics Covered**:
    - Setup and configure event sources and triggers
- **Hands-on/Project**:
    - Configure Argo Events to trigger workflows based on version control events

Module 6: Integrating Argo Tools

- **Topics Covered**:
    - Comprehensive use of Argo CD, Rollouts, Workflows, and Events
    - Using Argo Image Updater to connect CI and CD
- **Hands-on/Project**:
    - Integrate all Argo tools to create a seamless CI/CD pipeline for the micro services application.

Module 7: Automated Monitoring, Experiments and Rollback

- **Topics Covered**:

    - Setting up Monitoring Tools – Prometheus and Grafana
    - Configuring Metrics and Dashboards
    - Running Experiments
    - Automated Analysis and Rollback
- **Hands-on/Project**:
    - Configure and run automated experiments and automate the rollbacks using argo rollouts based on predefined criteria.