

## Developing Microservices

- 3 Days
- Lecture and Hands-on Labs

### Course Overview

Microservice architecture is a brave new world! Companies are abandoning the age-old monolith architecture for a modular approach that supports rapid expansion and compression of services. As your company grows, the more you'll find a transition to microservices is necessary! Make the journey work for your business by mastering an arsenal of tools to plan, communicate, and manage the transition to microservices in a cost effective way. In our labs, you will convert a clumsy monolithic application to agile microservices in a controlled environment. Learn firsthand how and why each step is taken in the orderly decision process of transitioning your environment to 100% microservices!

Review this course online at <https://www.alta3.com/courses/microservices>

### Who Should Attend

This class is targeted for anybody interested in the processes of Microservices; Developers, Operations Staff, Cloud Architects, DevOps and IT Professionals. The lab portion of this class has two paths; one for technical people and one for management.

### What You'll Learn

You will learn essential microservices concepts including:








- Refactor, untangle, and split monolithic services to support a transition to microservices.
- Pay down technical debt by understanding the benefits of supporting your business strategy with microservices.
- Develop proficiency with the most popular tools used by the experts who routinely deploy microservices.
- Clearly understand why the microservices revolution is driving DEVOPs towards simpler and more effective automation.
- Gain experience by deploying an actual microservices solution with API gateway, using Docker, Docker compose, Jenkins, and Kubernetes.
- Actually carry out the transition of monolith to microservices in a step by step hands on exercise.
- Learn how to incorporate an API gateway into your microservices ingress.
- Experiment with stateful solutions for microservices.
- Deploy Jenkins in a CI/CD pipeline.
- Learn how to use (and not use) ansible to deploy microservices solutions.
- AI LLM prompt engineering for relevant configuration snippets and solutions

### Outline



#### AI LLM Toolkit

-  Lecture + Lab: Large Language Model toolkit for AI Solution Assistance






## Introduction to Microservices

-  Lecture: Why Microservices?
  -  Lecture: Containerization
  -  Lecture + Lab: Define, build and modify container images
  -  Lecture: Intro to Kubernetes
  -  Lecture + Lab: Deploy Kubernetes using Ansible
  -  Lecture: Kubernetes Architecture
  -  Lecture + Lab: Deploy a Microserviced Boutique
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## Microservice Considerations

-  Lecture: Application Considerations
  -  Lecture: Infrastructure Considerations
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## Building our Monolith

-  Lecture: Our Monolith
  -  Lecture + Lab: Deploy a Monolith
  -  Lecture: Understanding Services
  -  Lecture: Service Discovery
  -  Lecture + Lab: Create a Service Registry
  -  Lecture: Patching Our Monolith
  -  Lecture + Lab: Connecting Our Monolith to the Service Registry
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## Databases and Service Runtime

-  Lecture: Microservices Transition Patterns
  -  Lecture + Lab: Create Your First Microservice (menu)
  -  Lecture: The DockerFile Base
  -  Lecture: Building on the DockerFile Base
  -  Lecture + Lab: Containerize Menu Microservice
  -  Lecture + Lab: Containerize 'To-do list' Service
  -  Lecture: Microservice Integration
  -  Lecture + Lab: Integrating Your Menu Microservice
  -  Lecture + Lab: Making More Microservices
  -  Lecture: Microservices Application
  -  Lecture: Scaling Microservices
  -  Lecture + Lab: Integrating More Microservices
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## CI/CD





-  Lecture: Containerize the Service Registry
-  Challenge: CHALLENGE! Containerize the Service Registry
-  Lecture: Feedback Loops
-  Lecture: Jenkins
-  Lecture: Blue/Green and Canary Deployment Strategies
-  Lecture + Lab: Advanced Deployment Strategies
-  Lecture: Other (outside) Services to be Aware Of

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## Deploying in Production

-  Lecture: Docker Compose
  -  Lecture + Lab: Deploy a Sock Shop with Docker Compose
  -  Lecture + Lab: Launch Your Microservices with Docker-Compose
  -  Lecture: Container Registries
  -  Lecture + Lab: Creating a Container Registry
  -  Lecture: Introduction to Kubernetes
  -  Lecture + Lab: Deploy Your Microservices in Kubernetes
  -  Lecture + Lab: Improving Our Application, One Microservice at a Time
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


## Multi-Container Pod Design

-  Lecture: Multi-Container Pods
-  Lecture + Lab: Understand the Sidecar Multi-Container Pod Design Pattern
-  Lecture: Init Containers
-  Lecture + Lab: Understand the Init Container Multi-Container Pod Design Pattern

## Jobs and CronJobs

-  Lecture: Jobs and CronJobs
-  Lecture + Lab: Understand Jobs and CronJobs

## Persistent Storage

-  Lecture: Persistent Volumes, Claims, and StorageClasses
-  Lecture + Lab: Using PersistentVolumeClaims for Storage
-  Lecture: Stateful Containers for Testing
-  Lecture + Lab: Persistent Storage with NFS

## Prerequisites

## Next Courses

- Kubernetes Bootcamp (<https://alta3.com/courses/sk8s-3day>)
- Jenkins Server Automation Essentials (<https://alta3.com/courses/jenkins>)