Effective DevOps with Ansible, AWS and Docker

Course Summary

Description

This hands-on course is packed with practical, real-world advice on building and evolving modern application infrastructures, while fully automating application deployment. With a focus on Ansible and Amazon Web Services, the key ideas translate to other tools and providers as well.

Starting with the core useful abstractions of Ansible - playbooks and plays, templating, and roles - before exploring higher-level devops patterns of node orchestration, configuration, deployment and control. The course concludes with containerization, using Docker.

Note this training is thoroughly hands-on; students are expected to fully participate, as they master the fundamentals of implementing devops with Ansible.

Objectives

Students will gain experience with the most useful features of Ansible; understand the key facets of configuration management; learn the principles of cloud server orchestration; and gain valuable, rarely-taught wisdom and insight into devops best practices.

Topics

- Introduction
- Core modules and how to use them
- Variables in Ansible
- More Advanced Playbooks
- Handlers
- Deploying applications
- Roles in Ansible
- Basic Database handling
- More Advanced Inventories
- Orchestration of multiple hosts
- Extending Ansible
- Managing credentials
- Cloud Orchestration with Ansible and AWS
- Tagging AWS resources
- Configuring AWS instances
- More advanced AWS orchestration
- The Ansible ecosystem: Ansible Galaxy
- Containers with Docker (Optional 4th Day)
- Container Orchestration (Optional 4th Day)
- Using Containers on AWS (Optional 4th Day)

Audience

This course is designed for developers, managers, and project leaders.

Prerequisites

There are no prerequisites for this course.

Duration

Four days
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Course Outline

I. Introduction
   A. Overview of YAML syntax (the format of playbooks)
   B. Understanding configuration management and server orchestration
   C. Building the Ansible Inventory
   D. Ansible commands
   E. Advanced SSH security for Ansible
   F. Playbooks for organization of tasks, policies, and designs
   G. Overview of YAML syntax (the format of playbooks)

II. Core modules and how to use them
   A. Installing system packages
   B. Working with files
   C. Starting and stopping services and daemons

III. Variables in Ansible
   A. Templating
   B. Leveraging the standard vars layout
   C. Simple scalar values
   D. Mapping types and list types

IV. More Advanced Playbooks
   A. Looping semantics
   B. Diving deeper into modules and tasks
   C. Conditionals (if, when)
   D. Inclusions

V. Handlers
   A. Thinking in terms of idempotency
   B. Triggering groups of tasks
   C. "notify" actions and single triggers
   D. Use cases for handlers

VI. Deploying applications
   A. Design and architecture of a REST API server
   B. Integrating Git, and the ansible git module
   C. Deploying an API server from Github

VII. Roles in Ansible
   A. Intro: roles as a powerful core abstraction

   B. Dividing responsibilities and functionality into roles
   C. Implementing simple roles

VIII. Basic Database handling
   A. Installation and configuration of SQL databases
   B. Role separation of DB and webserver concerns

IX. More Advanced Inventories
   A. Groupings
   B. Inventory-specific data
   C. Dynamic inventories

X. Orchestration of multiple hosts
   A. Inventory organization
   B. Network configuration

XI. Extending Ansible
   A. Creating custom modules
   B. Basic structure of a module
   C. Interfaces and output formats

XII. Managing credentials
   A. Credential models for Ansible
   B. Using ansible-vault
   C. Best practices for securely storing credentials

XIII. Cloud Orchestration with Ansible and AWS
   A. Working with AMIs
   B. ec2 module: create/terminate/etc. instances
   C. Working with security groups

XIV. Tagging AWS resources
   A. Tag setting
   B. Operations on tag sets
   C. Tags and dynamic inventories

XV. Configuring AWS instances
   A. Assigning elastic IPs
   B. Instance bootstrap
   C. Ansible-pull and pull-mode playbooks

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Course Outline (cont’d)

XVI. More advanced AWS orchestration
   A. Load balancing with Ansible
   B. Autoscaling groups
   C. Adjusting scaling policies
   D. Tagging AWS resources
   E. Attaching EBS volumes to instances

XVII. The Ansible ecosystem: Ansible Galaxy

XVIII. Containers with Docker (Optional 4th Day)
   A. Understanding containers - benefits and challenges
   B. Creating and running simple docker images
   C. Provisioning images with Dockerfiles
   D. Ansible and Docker

XIX. Container Orchestration (Optional 4th Day)
   A. Using Docker registries
   B. Image management
   C. Clustering with Kubernetes

XX. Using Containers on AWS (Optional 4th Day)
   A. ECS - Amazon’s EC2 Container Service
   B. ECR - AWS container registry