BLACKBIRD FOR TRAINING

Infrastructure as Code (IaC) with Terraform and Ansible

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Introduction

In the era of digital transformation and cloud adoption, managing infrastructure manually has become inefficient, error-prone, and time-consuming. Infrastructure as Code IaC introduces a paradigm shift by allowing teams to define, provision, and manage infrastructure using code, just like application development.

This course focuses on the practical implementation of IaC using Terraform and Ansible, two of the most powerful automation tools in modern IT operations. Participants will learn how to design scalable, secure, and repeatable infrastructure environments, automate deployments, and ensure consistency across multiple systems.

The program equips learners with the technical and strategic understanding needed to achieve operational agility, reduce costs, and improve system reliability through automation and standardization.

Course Objectives

- Understand the concept and advantages of Infrastructure as Code IaC.
- Learn how to automate infrastructure provisioning using Terraform.
- Manage system configurations and deployments through Ansible.
- Apply best practices for infrastructure version control and change management.
- Integrate security and compliance into automated workflows.
- Build reusable templates for consistent deployments across environments.
- Improve collaboration between development and operations teams.
- Implement monitoring and auditing mechanisms to ensure stability and compliance.

Course Outlines

Day 1: Introduction to Infrastructure as Code

- Core principles and benefits of Infrastructure as Code.
- Evolution from manual management to automated provisioning.
- Understanding declarative vs. imperative models.
- Key components of modern infrastructure automation.
- Introduction to state management and configuration logic.
- Real-world examples of IaC in enterprise environments.

Day 2: Building Automated Infrastructure with Terraform

- Overview of Terraform and its role in IaC ecosystems.
- Setting up the Terraform environment and configuration files.
- Writing, testing, and applying infrastructure templates.
- Managing dependencies and modular design structures.
- Implementing version control for Terraform code.
- Practical exercise: creating and deploying virtual resources.

Day 3: Configuration Management with Ansible

- Fundamentals of configuration automation and orchestration.
- Understanding Ansible architecture and inventory management.
- Writing playbooks and organizing roles for maintainable systems.
- Executing automated tasks across multiple servers.
- Using variables, conditionals, and loops in playbooks.
- Practical lab: Configuring servers automatically and securely.

Day 4: Integrating Terraform and Ansible

- Combining Terraform's provisioning capabilities with Ansible's configuration power.
- Workflow design for seamless integration between creation and setup phases.
- Managing dependencies between infrastructure and application layers.
- Automating multi-tier deployments across hybrid environments.
- Implementing testing and validation after deployment.
- Hands-on project: build a fully automated environment end-to-end.

Day 5: Security, Testing, and Continuous Improvement

- Embedding security principles within Infrastructure as Code.
- Managing access credentials and secrets safely.
- Testing infrastructure before production deployment.
- Monitoring performance and detecting configuration drifts.
- Continuous improvement through automation pipelines.
- Final review and full-scale implementation exercise.

Why Attend this Course: Wins & Losses!

- Gain hands-on expertise in designing and managing automated infrastructure.
- Learn to eliminate manual errors and increase deployment speed.
- Improve efficiency and consistency across development environments.
- Strengthen collaboration between Dev and Ops teams through shared automation.
- Reduce downtime and enhance service reliability.
- Apply security and compliance controls within the automation process.
- Develop in-demand technical and strategic skills for modern IT leadership.
- Build a foundation for adopting DevOps and cloud-native practices.

Conclusion

Infrastructure as Code represents a fundamental shift in how organizations manage IT resources. By adopting tools like Terraform and Ansible, teams can automate infrastructure provisioning, configuration, and deployment consistently and securely.

This course provides the essential framework and practical experience to design automated systems that are reliable, scalable, and compliant with modern standards.

Implementing IaC is not just a technical upgrade — it's a strategic move that enables faster innovation, reduced risk, and long-term operational excellence.