

# DEVOPS (IMPLEMENTING DEVOPS SOLUTIONS AND PRACTICES USING CISCO PLATFORMS) 1.0

## Objetivo

After taking this course, you should be able to:

- Describe the DevOps philosophy and practices, and how they apply to real-life challenges;
- Explain container-based architectures and available tooling provided by Docker;
- Describe application packaging into containers and start building secure container images;
- Utilize container networking and deploy a three-tier network application;
- Explain the concepts of Configuration Item (CI) pipelines and what tooling is available;
- Implement a basic pipeline with Gitlab CI that builds and deploys applications;
- Implement automated build testing and validation;
- Describe DevOps principles applied to infrastructure;
- Implement on-demand test environments and explain how to integrate them with an existing pipeline;
- Implement tooling for metric and log collection, analysis, and alerting;
- Describe the benefits of application health monitoring, telemetry, and chaos engineering in the context of improving the stability and reliability of the ecosystem;
- Describe how to implement secure DevOps workflows by safely handling sensitive data and validating applications;
- Explain design and operational concepts related to using a mix of public and private cloud deployments;
- Describe modern application design and microservices architectures;
- Describe the building blocks of Kubernetes and how to use its APIs to deploy an application;
- Explain advanced Kubernetes deployment patterns and implement an automated pipeline;
- Explain how monitoring, logging, and visibility concepts apply to Kubernetes.

## Público Alvo

This course is designed for network and software engineers interested in automation and programmability and who hold job roles such as:

- Account manager;
- Consulting systems engineer;
- Network administrator;
- Network engineer;
- Network manager;
- Sales engineer;
- Systems engineer;
- Technical solutions architect;
- Wireless design engineer;
- Wireless engineer.

## Pré-Requisitos

Before taking this course, you should have the following knowledge and skills:

- Basic programming language concepts and familiarity with Python;
- Basic understanding of compute virtualization;
- Ability to use Linux, text-driven interfaces, and CLI tools, such as Secure Shell (SSH), bash, grep, ip, vim/nano, curl, ping, traceroute, and telnet;
- Foundational understanding of Linux-based OS architecture and system utilities;
- CCNA® level core networking knowledge;
- Foundational understanding of DevOps concepts;
- Awareness and familiarity with continuous integration, continuous deployment, and continuous delivery (CI/CD) concepts;
- Hands-on experience with Git.

The following Cisco courses can help you gain the knowledge you need to prepare for this course:

- Developing Applications and Automating Workflows Using Cisco Core Platforms (DEVASC);
- Developing Applications Using Cisco Core Platforms and APIs (DEVCOR).

## Carga Horária

40 horas (5 dias).

## Conteúdo Programático

### Course Introduction

Course Outline

Course Goals & Objectives

Introducing the DevOps Model

Introducing Containers

Packaging an Application Using Docker

Deploying a Multitier Application

Introducing CI/CD

Building the DevOps Flow

Validating the Application Build Process

Building an Improved Deployment Flow

Extending DevOps Practices to the Entire Infrastructure

Implementing On-Demand Test Environments at the Infrastructure Level

Monitoring in NetDevOps

Engineering for Visibility and Stability

Securing DevOps Workflows

Exploring Multicloud Strategies

Examining Application and Deployment Architectures

Describing Kubernetes

Integrating Multiple Data Center Deployments with Kubernetes

Monitoring and Logging in Kubernetes

### Lab outline

Lab 1: Interact with GitLab Continuous Integration (CI)

Lab 2: Explore Docker Command-Line Tools

Lab 3: Package and Run a WebApp Container

Lab 4: Build and Deploy Multiple Containers to Create a Three-Tier Application

Lab 5: Explore Docker Networking

Lab 6: Build and Deploy an Application Using Docker Compose  
Lab 7: Implement a Pipeline in Gitlab CI  
Lab 8: Automate the Deployment of an Application  
Lab 9: Validate the Application Build Process  
Lab 10: Validate the Deployment and Fix the Infrastructure  
Lab 11: Build a Yaml Ain't Markup Language (YAML) Infrastructure as Code (IaC) Specification for the Test Environment  
Lab 12: Manage On-Demand Test Environments with Terraform  
Lab 13: Build Ansible Playbooks to Manage Infrastructure  
Lab 14: Integrate the Testing Environment in the CI/CD Pipeline  
Lab 15: Implement Pre-deployment Health Checks  
Lab 16: Set Up Logging for the Application Servers and Visualize with Kibana  
Lab 17: Create System Dashboard Focused on Metrics  
Lab 18: Use Alerts Through Kibana  
Lab 19: Instrument Application Monitoring  
Lab 20: Use Alerts and Thresholds to Notify Webhook Listener and Cisco Webex® Teams™ Rooms  
Lab 21: Secure Infrastructure in the CI/CD Pipeline  
Lab 22: Explore Kubernetes Setup and Deploy an Application  
Lab 23: Explore and Modify a Kubernetes CI/CD Pipeline  
Lab 24: Kubernetes Monitoring and Metrics—Elasticsearch, Logstash, and Kibana (ELK)