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Testcontainers Training

2 days (14 hours)

Overview

Testcontainers allows you to manage ephemeral Docker containers for reliable, reproducible, and production-like integration tests. With database support, wait strategies, and reusable containers, you can scale your testing without fragile dependencies.

Our Testcontainers training will help you go beyond basic setup to master the practical applications encountered in test automation and continuous integration projects.

You'll learn how to create test containers, manage their lifecycle with JUnit, configure database modules, orchestrate application dependencies, and ensure the reliability of asynchronous scenarios using wait strategies.

By the end of the training, you'll be able to design more representative tests, reduce false positives, secure validation environments, and build a more robust test pipeline for your development and QA teams.

This training also covers design best practices, generic containers, controlled reuse, executing commands within containers, and key considerations related to Docker infrastructure to ensure that tests are truly usable in a production environment.

Like all our training courses, this one will introduce you to **the latest stable version** of the technology and its new features.

Objectives

- Understand Testcontainers' role in an integration testing strategy.
- Create and configure test containers using JUnit and the basic APIs.
- Use database-specific modules to ensure the reliability of data access tests.
- Manage the container lifecycle, exposed ports, and environment variables.
- Apply wait strategies to properly synchronize test scenarios.
- Implement more robust testing practices for continuous integration.

Target Audience

- Java Developer
- QA Engineer
- Automation Tester
- Software Architect
- DevOps

Requirements

- Proficiency in the fundamentals of Java development.
- Knowledge of testing with JUnit or an equivalent framework.
- Experience with integration testing and validation environments.
- Basic understanding of Docker and application containers.
- General understanding of relational databases.

Technical Prerequisites

- A recent computer with sufficient memory to run Docker and the development IDE.
- Stable network connection (Wi-Fi or Ethernet) to download images and dependencies.
- An environment with Java 17 or a version compatible with the project.
- Configured IDE, such as IntelliJ IDEA or Eclipse, with access to the training project.
- A microphone and headset are recommended for remote participation and collaborative workshops.

Testcontainers Training Course Outline

[Day 1 - Morning]

Fundamentals and First Containers

- Understand the role of Testcontainers in modern integration testing.
- Identify relevant use cases, databases, external services, and temporary dependencies.
- Set up the local environment with Docker and a compatible testing framework.
- Explore the lifecycle of a test container: startup, shutdown, and isolation.
- Gain an understanding of generic containers and basic configuration options.

- Hands-on workshop: Create your first test that launches a simple container and checks its status from within the code.

[Day 1 - Afternoon] Integration

with Java Tests

- Integrate Testcontainers with JUnit 5 and structure test classes.
- Manage annotations, initialization rules, and the reuse of shared resources.
- Configure exposed ports, environment variables, and startup commands.
- Execute commands in a container to prepare for or control a test scenario.
- Organize readable and maintainable tests within an existing codebase.
- Hands-on workshop: Write a JUnit test suite that starts, configures, and queries a containerized service.

[Day 2 - Morning]

Databases and Synchronization

- Use database modules to test real-world data access.
- Compare the advantages of a real database engine with a simulated solution.
- Configure dedicated JDBC URLs and reproducible startup scenarios.
- Implement wait strategies to wait for a service to become available.
- Understand the concepts of container health, internal ports, and external ports.
- Hands-on workshop: Connect a test application to a database launched by Testcontainers and validate the queries.

[Day 2 - Afternoon] Industrialization

and Best Practices

- Master the controlled reuse of containers to speed up local execution.
- Understand the limitations of reuse and the precautions to take in CI.
- Structure multi-container scenarios with dependencies between services.
- Apply best practices for test robustness, isolation, and readability.
- Anticipate Docker runtime constraints and operational considerations.
- Hands-on workshop: Build a complete integration scenario with multiple containers and a robust wait strategy.

Target Companies

This training program is designed for both individuals and businesses—large and small—that wish to train their teams in new, advanced IT technologies or to acquire specific industry knowledge or modern methods.

Placement Assessment at the Start of Training

The pre-training assessment complies with Qualiopi quality standards. Upon final registration, the learner receives a self-assessment questionnaire that allows us to evaluate their estimated proficiency in various types of technologies, as well as their expectations and personal goals for the upcoming training, within the limits imposed by the selected format. This questionnaire also allows us to anticipate certain connection or internal security issues within the company (intra-company or virtual classroom) that could pose challenges for monitoring and ensuring the smooth running of the training session.

Teaching Methods

Hands-On Training: 60% hands-on, 40% theory. Training materials distributed in digital format to all participants.

Organization

The course alternates between theoretical input from the instructor—supported by examples and reflection sessions—and group work.

Assessment

At the end of the session, a multiple-choice quiz is administered to verify that participants have successfully acquired the skills.

Certification

A certificate will be issued to each trainee who has completed the entire training program.