

# Testing Java Microservices

**Moises Macero**

**Testing Java Microservices** Jason Porter,Alex Soto,Andrew Gumbrecht,2018-08-03 Summary Testing Java Microservices teaches you to implement unit and integration tests for microservice systems running on the JVM. You'll work with a microservice environment built using Java EE, WildFly Swarm, and Docker. You'll learn how to increase your test coverage and productivity, and gain confidence that your system will work as you expect. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Microservice applications present special testing challenges. Even simple services need to handle unpredictable loads, and distributed message-based designs pose unique security and performance concerns. These challenges increase when you throw in asynchronous communication and containers. About the Book Testing Java Microservices teaches you to implement unit and integration tests for microservice systems running on the JVM. You'll work with a microservice environment built using Java EE, WildFly Swarm, and Docker. You'll advance from writing simple unit tests for individual services to more-advanced practices like chaos or integration tests. As you move towards a continuous-delivery pipeline, you'll also master live system testing using technologies like the Arquillian, Wiremock, and Mockito frameworks, along with techniques like contract testing and over-the-wire service virtualization. Master these microservice-specific practices and tools and you'll greatly increase your test coverage and productivity, and gain confidence that your system will work as you expect. What's Inside Test automation Integration testing microservice systems Testing container-centric systems Service virtualization About the Reader Written for Java developers familiar with Java EE, EE4J, Spring, or Spring Boot. About the Authors Alex Soto Bueno and Jason Porter are Arquillian team members. Andy Gumbrecht is an Apache TomEE developer and PMC. They all have extensive enterprise-testing experience. Table of Contents An introduction to microservices Application under test Unit-testing microservices Component-testing microservices Integration-testing microservices Contract tests End-to-end testing Docker and testing Service virtualization Continuous delivery in microservices

*Testing Java Microservices* Alex Soto Bueno,Jason Porter,Andy Gumbrecht,2018-01-28 Summary Testing Java Microservices teaches you to implement unit and integration tests for microservice systems running on the JVM. You'll work with a microservice environment built using Java EE, WildFly Swarm, and Docker. You'll learn how to increase your test coverage and productivity, and gain confidence that your system will work as you expect. Purchase of the print book includes

a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Microservice applications present special testing challenges. Even simple services need to handle unpredictable loads, and distributed message-based designs pose unique security and performance concerns. These challenges increase when you throw in asynchronous communication and containers. About the Book Testing Java Microservices teaches you to implement unit and integration tests for microservice systems running on the JVM. You'll work with a microservice environment built using Java EE, WildFly Swarm, and Docker. You'll advance from writing simple unit tests for individual services to more-advanced practices like chaos or integration tests. As you move towards a continuous-delivery pipeline, you'll also master live system testing using technologies like the Arquillian, Wiremock, and Mockito frameworks, along with techniques like contract testing and over-the-wire service virtualization. Master these microservice-specific practices and tools and you'll greatly increase your test coverage and productivity, and gain confidence that your system will work as you expect. What's Inside Test automation Integration testing microservice systems Testing container-centric systems Service virtualization About the Reader Written for Java developers familiar with Java EE, EE4J, Spring, or Spring Boot. About the Authors Alex Soto Bueno and Jason Porter are Arquillian team members. Andy Gumbrecht is an Apache TomEE developer and PMC. They all have extensive enterprise-testing experience. Table of Contents An introduction to microservices Application under test Unit-testing microservices Component-testing microservices Integration-testing microservices Contract tests End-to-end testing Docker and testing Service virtualization Continuous delivery in microservices

*Hands-On Microservices - Monitoring and Testing* Dinesh Rajput, 2018-10-30 Learn and implement various techniques related to testing, monitoring and optimization for microservices architecture. Key Features Learn different approaches for testing microservices to design and implement, robust and secure applications Become more efficient while working with microservices Explore Testing and Monitoring tools such as JMeter, Ready API, and AppDynamics Book Description Microservices are the latest right way of developing web applications. Microservices architecture has been gaining momentum over the past few years, but once you've started down the microservices path, you need to test and optimize the services. This book focuses on exploring various testing, monitoring, and optimization techniques for microservices. The book starts with the evolution of software architecture style, from monolithic to virtualized, to microservices architecture. Then you will explore methods to deploy microservices and various implementation patterns. With the help of a real-world example, you will understand how external APIs help product developers to focus on core competencies. After that, you will learn testing techniques, such as Unit Testing, Integration Testing, Functional Testing, and Load Testing. Next, you will explore performance testing tools, such as JMeter, and Gatling. Then, we deep dive into monitoring techniques and learn performance benchmarking of the various architectural components. For this, you will explore monitoring tools such as Appdynamics, Dynatrace, AWS CloudWatch, and Nagios. Finally, you will learn to identify, address, and report various

performance issues related to microservices. What you will learn Understand the architecture of microservices and how to build services Establish how external APIs help to accelerate the development process Understand testing techniques, such as unit testing, integration testing, end-to-end testing, and UI/functional testing Explore various tools related to the performance testing, monitoring, and optimization of microservices Design strategies for performance testing Identify performance issues and fine-tune performance Who this book is for This book is for developers who are involved with microservices architecture to develop robust and secure applications. Basic knowledge of microservices is essential in order to get the most out of this book.

Enterprise Java Microservices Kenneth Finnigan, 2018-09-27 Summary Enterprise Java Microservices is an example-rich tutorial that shows how to design and manage large-scale Java applications as a collection of microservices. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Large applications are easier to develop and maintain when you build them from small, simple components. Java developers now enjoy a wide range of tools that support microservices application development, including right-sized app servers, open source frameworks, and well-defined patterns. Best of all, you can build microservices applications using your existing Java skills. About the Book Enterprise Java Microservices teaches you to design and build JVM-based microservices applications. You'll start by learning how microservices designs compare to traditional Java EE applications. Always practical, author Ken Finnigan introduces big-picture concepts along with the tools and techniques you'll need to implement them. You'll discover ecosystem components like Netflix Hystrix for fault tolerance and master the Just enough Application Server (JeAS) approach. To ensure smooth operations, you'll also examine monitoring, security, testing, and deploying to the cloud. What's inside The microservices mental model Cloud-native development Strategies for fault tolerance and monitoring Securing your finished applications About the Reader This book is for Java developers familiar with Java EE. About the Author Ken Finnigan leads the Thorntail project at Red Hat, which seeks to make developing microservices for the cloud with Java and Java EE as easy as possible. Table of Contents PART 1 MICROSERVICES BASICS Enterprise Java microservices Developing a simple RESTful microservice Just enough Application Server for microservices Microservices testing Cloud native development PART 2 - IMPLEMENTING ENTERPRISE JAVA MICROSERVICES Consuming microservices Discovering microservices for consumption Strategies for fault tolerance and monitoring Securing a microservice Architecting a microservice hybrid Data streaming with Apache Kafka

*Cloud Native Microservices with Spring and Kubernetes* Rajiv Srivastava, 2021-07-03 Build and deploy scalable cloud native microservices using the Spring framework and Kubernetes. KEY FEATURES ● Complete coverage on how to design, build, run, and deploy modern cloud native microservices. ● Includes numerous sample code exercises on microservices, Spring and Kubernetes. ● Develop a stronghold on Kubernetes, Spring, and the microservices architecture. ● Complete

guide of application containerization on Kubernetes containers. ● Coverage on managing modern applications and infrastructure using observability tools. DESCRIPTION The main objective of this book is to give an overview of cloud native microservices, their architecture, design patterns, best practices, real use cases and practical coverage of modern applications. This book covers a strong understanding of the fundamentals of microservices, API first approach, Testing, observability, API Gateway, Service Mesh and Kubernetes alternatives of Spring Cloud. This book covers the implementation of various design patterns of developing cloud native microservices using Spring framework docker and Kubernetes libraries. It covers containerization concepts and hands-on lab exercises like how to build, run and manage microservices applications using Kubernetes. After reading this book, the readers will have a holistic understanding of building, running, and managing cloud native microservices applications on Kubernetes containers. WHAT YOU WILL LEARN ● Learn fundamentals of microservice and design patterns. ● Learn microservices development using Spring Boot and Kubernetes. ● Learn to develop reactive, event-driven, and batch microservices. ● Perform end-to-end microservices testing using Cucumber. ● Implement API gateway, authentication & authorization, load balancing, caching, rate limiting. ● Learn observability and monitoring techniques of microservices. WHO THIS BOOK IS FOR This book is for the Spring Developers, Microservice Developers, Cloud Engineers, DevOps Consultants, Technical Architect and Solution Architects, who have some familiarity with application development, Docker and Kubernetes containers. TABLE OF CONTENTS 1. Overview of Cloud Native microservices 2. Microservice design patterns 3. API first approach 4. Build microservices using the Spring Framework 5. Batch microservices 6. Build reactive and event-driven microservices 7. The API gateway, security, and distributed caching with Redis 8. Microservices testing and API mocking 9. Microservices observability 10. Containers and Kubernetes overview and architecture 11. Run microservices on Kubernetes 12. Service Mesh and Kubernetes alternatives of Spring Cloud

*SRE with Java Microservices* Jonathan Schneider, 2020-08-27 In a microservices architecture, the whole is indeed greater than the sum of its parts. But in practice, individual microservices can inadvertently impact others and alter the end user experience. Effective microservices architectures require standardization on an organizational level with the help of a platform engineering team. This practical book provides a series of progressive steps that platform engineers can apply technically and organizationally to achieve highly resilient Java applications. Author Jonathan Schneider covers many effective SRE practices from companies leading the way in microservices adoption. You'll examine several patterns discovered through much trial and error in recent years, complete with Java code examples. Chapters are organized according to specific patterns, including: Application metrics: Monitoring for availability with Micrometer Debugging with observability: Logging and distributed tracing; failure injection testing Charting and alerting: Building effective charts; KPIs for Java microservices Safe multicloud delivery: Spinnaker, deployment strategies, and automated canary analysis Source code observability: Dependency management, API utilization, and end-to-end asset inventory Traffic management:

Concurrency of systems; platform, gateway, and client-side load balancing

**Microservices Patterns** Chris Richardson, 2018-10-27 A comprehensive overview of the challenges teams face when moving to microservices, with industry-tested solutions to these problems. - Tim Moore, Lightbend 44 reusable patterns to develop and deploy reliable production-quality microservices-based applications, with worked examples in Java Key Features 44 design patterns for building and deploying microservices applications Drawing on decades of unique experience from author and microservice architecture pioneer Chris Richardson A pragmatic approach to the benefits and the drawbacks of microservices architecture Solve service decomposition, transaction management, and inter-service communication Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About The Book **Microservices Patterns** teaches you 44 reusable patterns to reliably develop and deploy production-quality microservices-based applications. This invaluable set of design patterns builds on decades of distributed system experience, adding new patterns for composing services into systems that scale and perform under real-world conditions. More than just a patterns catalog, this practical guide with worked examples offers industry-tested advice to help you design, implement, test, and deploy your microservices-based application. What You Will Learn How (and why!) to use microservices architecture Service decomposition strategies Transaction management and querying patterns Effective testing strategies Deployment patterns This Book Is Written For Written for enterprise developers familiar with standard enterprise application architecture. Examples are in Java. About The Author Chris Richardson is a Java Champion, a JavaOne rock star, author of Manning's *POJOs in Action*, and creator of the original *CloudFoundry.com*. Table of Contents Escaping monolithic hell Decomposition strategies Interprocess communication in a microservice architecture Managing transactions with sagas Designing business logic in a microservice architecture Developing business logic with event sourcing Implementing queries in a microservice architecture External API patterns Testing microservices: part 1 Testing microservices: part 2 Developing production-ready services Deploying microservices Refactoring to microservices

[Learn Microservices with Spring Boot](#) Moises Macero, 2017-12-08 Build a microservices architecture with Spring Boot, by evolving an application from a small monolith to an event-driven architecture composed of several services. This book follows an incremental approach to teach microservice structure, test-driven development, Eureka, Ribbon, Zuul, and end-to-end tests with Cucumber. Author Moises Macero follows a very pragmatic approach to explain the benefits of using this type of software architecture, instead of keeping you distracted with theoretical concepts. He covers some of the state-of-the-art techniques in computer programming, from a practical point of view. You'll focus on what's important, starting with the minimum viable product but keeping the flexibility to evolve it. What You'll Learn Build microservices with Spring Boot Use event-driven architecture and messaging with RabbitMQ Create RESTful services with Spring Master service discovery with Eureka and load balancing with Ribbon Route requests with Zuul as your API gateway Write end-to-end tests for an event-

driven architecture using Cucumber Carry out continuous integration and deployment Who This Book Is For Those with at least some prior experience with Java programming. Some prior exposure to Spring Boot recommended but not required.

**Hands-On Microservices with Spring Boot and Spring Cloud** Magnus Larsson,2019-09-20 Apply microservices patterns to build resilient and scalable distributed systems Key Features Understand the challenges of building large-scale microservice landscapes Build cloud-native production-ready microservices with this comprehensive guide Discover how to get the best out of Spring Cloud, Kubernetes, and Istio when used together Book DescriptionMicroservices architecture allows developers to build and maintain applications with ease, and enterprises are rapidly adopting it to build software using Spring Boot as their default framework. With this book, you'll learn how to efficiently build and deploy microservices using Spring Boot. This microservices book will take you through tried and tested approaches to building distributed systems and implementing microservices architecture in your organization. Starting with a set of simple cooperating microservices developed using Spring Boot, you'll learn how you can add functionalities such as persistence, make your microservices reactive, and describe their APIs using Swagger/OpenAPI. As you advance, you'll understand how to add different services from Spring Cloud to your microservice system. The book also demonstrates how to deploy your microservices using Kubernetes and manage them with Istio for improved security and traffic management. Finally, you'll explore centralized log management using the EFK stack and monitor microservices using Prometheus and Grafana. By the end of this book, you'll be able to build microservices that are scalable and robust using Spring Boot and Spring Cloud.What you will learn Build reactive microservices using Spring Boot Develop resilient and scalable microservices using Spring Cloud Use OAuth 2.0/OIDC and Spring Security to protect public APIs Implement Docker to bridge the gap between development, testing, and production Deploy and manage microservices using Kubernetes Apply Istio for improved security, observability, and traffic management Who this book is for This book is for Java and Spring developers and architects who want to learn how to break up their existing monoliths into microservices and deploy them either on-premises or in the cloud using Kubernetes as a container orchestrator and Istio as a service Mesh. No familiarity with microservices architecture is required to get started with this book.

*Microservices Best Practices for Java* Michael Hofmann,Erin Schnabel,Katherine Stanley,IBM Redbooks,2017-03-13 Microservices is an architectural style in which large, complex software applications are composed of one or more smaller services. Each of these microservices focuses on completing one task that represents a small business capability. These microservices can be developed in any programming language. This IBM® Redbooks® publication covers Microservices best practices for Java. It focuses on creating cloud native applications using the latest version of IBM WebSphere® Application Server Liberty, IBM Bluemix® and other Open Source Frameworks in the Microservices ecosystem to highlight Microservices best practices for Java.

**Mastering Spring Boot 2.0** Dinesh Rajput,2018-05-31 Learn to develop, test, and deploy your Spring Boot distributed application and explore various best practices. Key Features Build and deploy your microservices architecture in the cloud Build event-driven resilient systems using Hystrix and Turbine Explore API management tools such as KONG and API documentation tools such as Swagger Book Description Spring is one of the best frameworks on the market for developing web, enterprise, and cloud ready software. Spring Boot simplifies the building of complex software dramatically by reducing the amount of boilerplate code, and by providing production-ready features and a simple deployment model. This book will address the challenges related to power that come with Spring Boot's great configurability and flexibility. You will understand how Spring Boot configuration works under the hood, how to overwrite default configurations, and how to use advanced techniques to prepare Spring Boot applications to work in production. This book will also introduce readers to a relatively new topic in the Spring ecosystem - cloud native patterns, reactive programming, and applications. Get up to speed with microservices with Spring Boot and Spring Cloud. Each chapter aims to solve a specific problem or teach you a useful skillset. By the end of this book, you will be proficient in building and deploying your Spring Boot application. What you will learn Build logically structured and highly maintainable Spring Boot applications Configure RESTful microservices using Spring Boot Make the application production and operation-friendly with Spring Actuator Build modern, high-performance distributed applications using cloud patterns Manage and deploy your Spring Boot application to the cloud (AWS) Monitor distributed applications using log aggregation and ELK Who this book is for The book is targeted at experienced Spring and Java developers who have a basic knowledge of working with Spring Boot. The reader should be familiar with Spring Boot basics, and aware of its benefits over traditional Spring Framework-based applications.

**Mastering Microservices with Java 9** Sourabh Sharma,2017-12-07 Master the art of implementing scalable microservices in your production environment with ease About This Book Use domain-driven design to build microservices Use Spring Cloud to use Service Discovery and Registration Use Kafka, Avro and Spring Streams for implementing event based microservices Who This Book Is For This book is for Java developers who are familiar with the microservices architecture and now wants to take a deeper dive into effectively implementing microservices at an enterprise level. A reasonable knowledge level and understanding of core microservice elements and applications is expected. What You Will Learn Use domain-driven design to design and implement microservices Secure microservices using Spring Security Learn to develop REST service development Deploy and test microservices Troubleshoot and debug the issues faced during development Learning best practices and common principals about microservices In Detail Microservices are the next big thing in designing scalable, easy-to-maintain applications. It not only makes app development easier, but also offers great flexibility to utilize various resources optimally. If you want to build an enterprise-ready implementation of the microservices architecture, then this is the book for you! Starting off by understanding the core concepts and framework, you will then focus on the high-level design

of large software projects. You will gradually move on to setting up the development environment and configuring it before implementing continuous integration to deploy your microservice architecture. Using Spring security, you will secure microservices and test them effectively using REST Java clients and other tools like RxJava 2.0. We'll show you the best patterns, practices and common principals of microservice design and you'll learn to troubleshoot and debug the issues faced during development. We'll show you how to design and implement reactive microservices. Finally, we'll show you how to migrate a monolithic application to microservices based application. By the end of the book, you will know how to build smaller, lighter, and faster services that can be implemented easily in a production environment. Style and approach This book starts from the basics, including environment setup and provides easy-to-follow steps to implement the sample project using microservices.

**Microservices with Spring Boot and Spring Cloud** Magnus Larsson, 2021-07-29 A step-by-step guide to creating and deploying production-quality microservices-based applications Key Features Build cloud-native production-ready microservices with this comprehensively updated guide Understand the challenges of building large-scale microservice architectures Learn how to get the best out of Spring Cloud, Kubernetes, and Istio in combination Book Description With this book, you'll learn how to efficiently build and deploy microservices. This new edition has been updated for the most recent versions of Spring, Java, Kubernetes, and Istio, demonstrating faster and simpler handling of Spring Boot, local Kubernetes clusters, and Istio installation. The expanded scope includes native compilation of Spring-based microservices, support for Mac and Windows with WSL2, and an introduction to Helm 3 for packaging and deployment. A revamped security chapter now follows the OAuth 2.1 specification and makes use of the newly launched Spring Authorization Server from the Spring team. Starting with a set of simple cooperating microservices, you'll add persistence and resilience, make your microservices reactive, and document their APIs using OpenAPI. You'll understand how fundamental design patterns are applied to add important functionality, such as service discovery with Netflix Eureka and edge servers with Spring Cloud Gateway. You'll learn how to deploy your microservices using Kubernetes and adopt Istio. You'll explore centralized log management using the Elasticsearch, Fluentd, and Kibana (EFK) stack and monitor microservices using Prometheus and Grafana. By the end of this book, you'll be confident in building microservices that are scalable and robust using Spring Boot and Spring Cloud. What you will learn Build reactive microservices using Spring Boot Develop resilient and scalable microservices using Spring Cloud Use OAuth 2.1/OIDC and Spring Security to protect public APIs Implement Docker to bridge the gap between development, testing, and production Deploy and manage microservices with Kubernetes Apply Istio for improved security, observability, and traffic management Write and run automated microservice tests with JUnit, testcontainers, Gradle, and bash Who this book is for If you are a Java or Spring Boot developer who wants to learn how to build microservice landscapes from scratch, this book is for you. No familiarity with microservices architecture is required.



**Mastering Microservices with Java** Sourabh Sharma, 2019-02-26 Master the art of implementing scalable and reactive microservices in your production environment with Java 11 Key Features Use domain-driven designs to build microservices Explore various microservices design patterns such as service discovery, registration, and API Gateway Use Kafka, Avro, and Spring Streams to implement event-based microservices Book Description Microservices are key to designing scalable, easy-to-maintain applications. This latest edition of Mastering Microservices with Java, works on Java 11. It covers a wide range of exciting new developments in the world of microservices, including microservices patterns, interprocess communication with gRPC, and service orchestration. This book will help you understand how to implement microservice-based systems from scratch. You'll start off by understanding the core concepts and framework, before focusing on the high-level design of large software projects. You'll then use Spring Security to secure microservices and test them effectively using REST Java clients and other tools. You will also gain experience of using the Netflix OSS suite, comprising the API Gateway, service discovery and registration, and Circuit Breaker. Additionally, you'll be introduced to the best patterns, practices, and common principles of microservice design that will help you to understand how to troubleshoot and debug the issues faced during development. By the end of this book, you'll have learned how to build smaller, lighter, and faster services that can be implemented easily in a production environment. What you will learn Use domain-driven designs to develop and implement microservices Understand how to implement microservices using Spring Boot Explore service orchestration and distributed transactions using the Sagas Discover interprocess communication using REpresentational State Transfer (REST) and events Gain knowledge of how to implement and design reactive microservices Deploy and test various microservices Who this book is for This book is designed for Java developers who are familiar with microservices architecture and now want to effectively implement microservices at an enterprise level. Basic knowledge and understanding of core microservice elements and applications is necessary.

**Testing Microservices with Mountebank** Brandon Byars, 2018-12-01 Summary Testing Microservices with Mountebank is your guide to the ins and outs of testing microservices with service virtualization. The book offers unique insights into microservices application design and state-of-the-art testing practices that will deepen your microservices skills and improve your applications. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Even if you lab test each service in isolation, it's challenging—and potentially dangerous—to test a live microservices system that's changing and growing. Fortunately, you can use Mountebank to imitate the components of a distributed microservices application to give you a good approximation of the runtime conditions as you test individual services. About the Book Testing Microservices with Mountebank introduces the powerful practice of service virtualization. In it, author Brandon Byars, Mountebank's creator, offers unique insights into microservices application design and state-of-the-art testing practices. You'll expand your understanding of microservices as you work with Mountebank's

imposters, responses, behaviors, and programmability. By mastering the powerful testing techniques in this unique book, your microservices skills will deepen and your applications will improve. For real. What's inside The core concepts of service virtualization Testing using canned responses Programming Mountebank Performance testing About the Reader Written for developers familiar with SOA or microservices systems. About the Author Brandon Byars is the author and chief maintainer of Mountebank and a principal consultant at ThoughtWorks. Table of Contents PART 1 - FIRST STEPS Testing microservices Taking mountebank for a test drive PART 2 - USING MOUNTEBANK Testing using canned responses Using predicates to send different responses Adding record/replay behavior Programming mountebank Adding behaviors Protocols PART 3 - CLOSING THE LOOP Mountebank and continuous delivery Performance testing with mountebank

*Kubernetes Native Microservices with Quarkus and MicroProfile* John Clingan, Ken Finnigan, 2022-03-01 Build fast, efficient Kubernetes-based Java applications using the Quarkus framework, MicroProfile, and Java standards. In *Kubernetes Native Microservices with Quarkus and MicroProfile* you'll learn how to: Deploy enterprise Java applications on Kubernetes Develop applications using the Quarkus runtime Compile natively using GraalVM for blazing speed Create efficient microservices applications Take advantage of MicroProfile specifications Popular Java frameworks like Spring were designed long before Kubernetes and the microservices revolution. *Kubernetes Native Microservices with Quarkus and MicroProfile* introduces next generation tools that have been cloud-native and Kubernetes-aware right from the beginning. Written by veteran Java developers John Clingan and Ken Finnigan, this book shares expert insight into Quarkus and MicroProfile directly from contributors at Red Hat. You'll learn how to utilize these modern tools to create efficient enterprise Java applications that are easy to deploy, maintain, and expand. About the technology Build microservices efficiently with modern Kubernetes-first tools! Quarkus works naturally with containers and Kubernetes, radically simplifying the development and deployment of microservices. This powerful framework minimizes startup time and memory use, accelerating performance and reducing hosting cost. And because it's Java from the ground up, it integrates seamlessly with your existing JVM codebase. About the book *Kubernetes Native Microservices with Quarkus and MicroProfile* teaches you to build microservices using containers, Kubernetes, and the Quarkus framework. You'll immediately start developing a deployable application using Quarkus and the MicroProfile APIs. Then, you'll explore the startup and runtime gains Quarkus delivers out of the box and also learn how to supercharge performance by compiling natively using GraalVM. Along the way, you'll see how to integrate a Quarkus application with Spring and pick up pro tips for monitoring and managing your microservices. What's inside Deploy enterprise Java applications on Kubernetes Develop applications using the Quarkus runtime framework Compile natively using GraalVM for blazing speed Take advantage of MicroProfile specifications About the reader For intermediate Java developers comfortable with Java EE, Jakarta EE, or Spring. Some experience with Docker and Kubernetes required. About the author John Clingan is a senior principal product manager at Red Hat, where he works on enterprise Java

standards and Quarkus. Ken Finnigan is a senior principal software engineer at Workday, previously at Red Hat working on Quarkus. Table of Contents PART 1 INTRODUCTION 1 Introduction to Quarkus, MicroProfile, and Kubernetes 2 Your first Quarkus application PART 2 DEVELOPING MICROSERVICES 3 Configuring microservices 4 Database access with Panache 5 Clients for consuming other microservices 6 Application health 7 Resilience strategies 8 Reactive in an imperative world 9 Developing Spring microservices with Quarkus PART 3 OBSERVABILITY, API DEFINITION, AND SECURITY OF MICROSERVICES 10 Capturing metrics 11 Tracing microservices 12 API visualization 13 Securing a microservice

Test-Driven Java Development Viktor Farcic, Alex Garcia, 2015-08-27 Invoke TDD principles for end-to-end application development with Java About This Book Explore the most popular TDD tools and frameworks and become more proficient in building applications Create applications with better code design, fewer bugs, and higher test coverage, enabling you to get them to market quickly Implement test-driven programming methods into your development workflows Who This Book Is For If you're an experienced Java developer and want to implement more effective methods of programming systems and applications, then this book is for you. What You Will Learn Explore the tools and frameworks required for effective TDD development Perform the Red-Green-Refactor process efficiently, the pillar around which all other TDD procedures are based Master effective unit testing in isolation from the rest of your code Design simple and easily maintainable codes by implementing different techniques Use mocking frameworks and techniques to easily write and quickly execute tests Develop an application to implement behaviour-driven development in conjunction with unit testing Enable and disable features using Feature Toggles In Detail Test-driven development (TDD) is a development approach that relies on a test-first procedure that emphasises writing a test before writing the necessary code, and then refactoring the code to optimize it. The value of performing TDD with Java, one of the most established programming languages, is to improve the productivity of programmers, the maintainability and performance of code, and develop a deeper understanding of the language and how to employ it effectively. Starting with the basics of TDD and reasons why its adoption is beneficial, this book will take you from the first steps of TDD with Java until you are confident enough to embrace the practice in your day-to-day routine. You'll be guided through setting up tools, frameworks, and the environment you need, and will dive right in to hands-on exercises with the goal of mastering one practice, tool, or framework at a time. You'll learn about the Red-Green-Refactor procedure, how to write unit tests, and how to use them as executable documentation. With this book you'll also discover how to design simple and easily maintainable code, work with mocks, utilise behaviour-driven development, refactor old legacy code, and release a half-finished feature to production with feature toggles. You will finish this book with a deep understanding of the test-driven development methodology and the confidence to apply it to application programming with Java. Style and approach An easy-to-follow, hands-on guide to building applications through effective coding practices. This book covers practical examples by introducing different problems, each one designed as a learning exercise to help you understand each aspect of TDD.

**Learn Microservices with Spring Boot 3** Moisés Macero García,2021-01-12 Build Java-based microservices architecture using the Spring Boot 3 framework by evolving an application from a small monolith to an event-driven architecture composed of several services. This revised book follows an incremental approach in teaching the structure of microservices, test-driven development, Eureka, Ribbon, Zuul, and end-to-end tests with Cucumber. This updated book now covers what's been added to the new Spring Boot 3 release, including support for the latest Java SE LTS; changes to the Stream Editor UI; Maven preemptive authentication; building Docker images using cloud-native build packs; building layered jars for optimized Docker images; E2E traceability for configuration properties; many dependency upgrades; support for Spring Data Neumann; and more. Author Moises Macero uses a pragmatic approach to explain the benefits of using this type of software architecture, instead of keeping you distracted with theoretical concepts. He covers some of the state-of-the-art techniques in computer programming, from a practical point of view. You'll focus on what's important, starting with the minimum viable product but keeping the flexibility to evolve it. What You Will Learn Build microservices with Spring Boot 3 Use event-driven architecture and messaging with RabbitMQ Master service discovery with Eureka and load balancing with Ribbon Route requests with Zuul as your API gateway Write end-to-end tests for an event-driven architecture using Cucumber Carry out continuous integration and deployment Who This Book Is For Those with at least some prior experience with Java programming. Some prior exposure to Spring Boot recommended but not required.

**Production-Ready Microservices** Susan J. Fowler,2016-11-30 One of the biggest challenges for organizations that have adopted microservice architecture is the lack of architectural, operational, and organizational standardization. After splitting a monolithic application or building a microservice ecosystem from scratch, many engineers are left wondering what's next. In this practical book, author Susan Fowler presents a set of microservice standards in depth, drawing from her experience standardizing over a thousand microservices at Uber. You'll learn how to design microservices that are stable, reliable, scalable, fault tolerant, performant, monitored, documented, and prepared for any catastrophe. Explore production-readiness standards, including: Stability and Reliability: develop, deploy, introduce, and deprecate microservices; protect against dependency failures Scalability and Performance: learn essential components for achieving greater microservice efficiency Fault Tolerance and Catastrophe Preparedness: ensure availability by actively pushing microservices to fail in real time Monitoring: learn how to monitor, log, and display key metrics; establish alerting and on-call procedures Documentation and Understanding: mitigate tradeoffs that come with microservice adoption, including organizational sprawl and technical debt

[Bootstrapping Microservices with Docker, Kubernetes, and Terraform](#) Ashley Davis,2021-01-23 Summary The best way to learn microservices development is to build something! Bootstrapping Microservices with Docker, Kubernetes, and Terraform guides you from zero through to a complete microservices project, including fast prototyping, development, and deployment. You'll get your feet wet using industry-standard tools as you learn and practice the practical skills you'll use for

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## Table of Contents Testing Java Microservices

### 1. Understanding the eBook Testing

#### Java Microservices

- The Rise of Digital Reading Testing Java Microservices
- Advantages of eBooks Over Traditional Books

### 2. Identifying Testing Java Microservices

- Exploring Different Genres
- Considering Fiction vs. Non-Fiction

- 
- Determining Your Reading Goals
3. Choosing the Right eBook Platform
    - Popular eBook Platforms
    - Features to Look for in an Testing Java Microservices
    - User-Friendly Interface
  4. Exploring eBook Recommendations from Testing Java Microservices
    - Personalized Recommendations
    - Testing Java Microservices User Reviews and Ratings
    - Testing Java Microservices and Bestseller Lists
  5. Accessing Testing Java Microservices Free and Paid eBooks
    - Testing Java Microservices Public Domain eBooks
    - Testing Java Microservices eBook Subscription Services
    - Testing Java Microservices Budget-Friendly Options
  6. Navigating Testing Java Microservices eBook Formats
    - ePub, PDF, MOBI, and More
  7. Enhancing Your Reading Experience
    - Adjustable Fonts and Text Sizes of Testing Java Microservices
    - Highlighting and Note-Taking Testing Java Microservices
    - Interactive Elements Testing Java Microservices
  8. Staying Engaged with Testing Java Microservices
    - Joining Online Reading Communities
    - Participating in Virtual Book Clubs
    - Following Authors and Publishers Testing Java Microservices
  9. Balancing eBooks and Physical Books Testing Java Microservices
    - Benefits of a Digital Library
    - Creating a Diverse Reading Collection Testing Java Microservices
  10. Overcoming Reading Challenges
    - Dealing with Digital Eye Strain
    - Minimizing Distractions
    - Managing Screen Time
  11. Cultivating a Reading Routine Testing Java Microservices
    - Setting Reading Goals Testing Java Microservices
    - Carving Out Dedicated Reading Time
  12. Sourcing Reliable Information of Testing Java Microservices
    - Fact-Checking eBook Content of Testing Java Microservices
    - Distinguishing Credible Sources
  13. Promoting Lifelong Learning
    - Utilizing eBooks for Skill Development
    - Exploring Educational eBooks
  14. Embracing eBook Trends
    - Integration of Multimedia Elements
    - Interactive and Gamified eBooks

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