

practical cloud-native java development with microprofile pdf

practical cloud-native java development with microprofile pdf is an invaluable resource for Java developers aiming to build scalable, resilient, and efficient cloud-native applications. As cloud computing continues to dominate the software landscape, understanding how to leverage MicroProfile—a set of specifications optimized for microservices—becomes essential. This comprehensive article explores the key concepts, best practices, and practical insights needed to develop cloud-native Java applications using MicroProfile, with a focus on the accompanying PDF documentation that serves as a vital reference.

Introduction to Cloud-Native Java Development

Cloud-native development involves designing and building applications that fully exploit the advantages of cloud environments. These applications are designed to be:

- Scalable: Capable of handling increased load by adding resources.
- Resilient: Able to recover quickly from failures.
- Manageable: Easy to deploy, update, and maintain.
- Observable: Providing insights into their health and performance.

Java, historically known for enterprise applications, has evolved with frameworks and specifications like MicroProfile that facilitate the development of cloud-ready microservices.

Understanding MicroProfile and Its Role in Java Cloud-Native Development

What is MicroProfile?

MicroProfile is an open-source initiative that defines a set of Java APIs optimized for microservices architecture. It extends the capabilities of Java EE / Jakarta EE to simplify the development of cloud-native microservices by providing standard APIs for common concerns like configuration, fault tolerance, health checks, metrics, and more.

Key Features of MicroProfile

- Config: Externalized configuration management.
- Fault Tolerance: Handling failures gracefully.
- Health Checks: Monitoring application health.
- Metrics: Gathering performance data.
- JWT Propagation: Secure communication between services.
- OpenAPI & REST Client: Simplified API documentation and client creation.

Why Use MicroProfile for Cloud-Native Java Development?

- Standards-Based: Ensures portability and compatibility.
- Lightweight: Designed for microservices, avoiding heavyweight frameworks.
- Extensible: Modular with various specifications.
- Integration Friendly: Works seamlessly with container orchestration tools like Kubernetes.

Developing Cloud-Native Java Applications Using MicroProfile

Setting Up the Development Environment

To develop MicroProfile-based applications, you need:

- An IDE such as IntelliJ IDEA or Eclipse.
- Java Development Kit (JDK 11 or higher).
- A compatible MicroProfile runtime, such as Payara Micro, OpenLiberty, Quarkus, or Thorntail.
- Build tools like Maven or Gradle.
- Docker for containerization.

Creating a MicroProfile Microservice

1. Initialize a Maven Project with MicroProfile dependencies:

```
```xml
```

```
org.eclipse.microprofile
microprofile
4.1
```

```
```
```

2. Implement REST Endpoints using JAX-RS:

```
```java
@Path("/hello")
public class HelloResource {

 @GET
 @Produces(MediaType.TEXT_PLAIN)
 public String sayHello() {
 return "Hello, Cloud Native World!";
 }
}
```
```

3. Configure MicroProfile Features with annotations and configuration files as needed.

Implementing MicroProfile Specifications for Cloud-Native Features

- Configuration: Use `@ConfigProperty` to externalize settings.

```
```java
@Inject
@ConfigProperty(name = "app.greeting", defaultValue = "Hello")
String greeting;
```
```

- Fault Tolerance: Apply `@Retry`, `@CircuitBreaker`, and `@Timeout` to enhance resilience.

```
```java
@GET
@Path("/unstable")
@Retry(maxRetries = 3)
public String unstableEndpoint() {
 // simulate failure
}
```
```

- Health Checks: Define health check endpoints to monitor service health.

```
```java
@Readiness
@ApplicationScoped
public class ApplicationHealthCheck implements HealthCheck {
 public HealthCheckResponse call() {
 return HealthCheckResponse.named("Database connection").up().build();
 }
}
```

```
}
...
```

- Metrics: Collect custom metrics using the `@Counted` annotation.

```
```java  
@GET  
@Path("/count")  
@Counted(name = "invocationsCounter")  
public String countEndpoint() {  
    return "Counter incremented!";  
}  
```
```

---

## Containerizing and Deploying MicroProfile Applications

### Containerization with Docker

- Write a Dockerfile:

```
```dockerfile  
FROM openliberty/open-liberty:kernel-java11  
COPY --chown=admin:admin target/my-microprofile-app.war /config/dropins/  
```
```

- Build and run:

```
```bash  
docker build -t my-microprofile-app .  
docker run -it -p 8080:8080 my-microprofile-app  
```
```

### Deploying to Kubernetes

- Create deployment and service YAML files.
- Use ConfigMaps and Secrets for configuration and security.
- Leverage Kubernetes features like autoscaling, rolling updates, and health probes.

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# Best Practices for Practical Cloud-Native Java Development with MicroProfile

- **Design for Failure:** Use fault tolerance APIs to handle partial failures.
- **Externalize Configuration:** Use Config API to manage environment-specific settings.
- **Implement Observability:** Collect metrics, logs, and health data for monitoring.
- **Secure Microservices:** Use JWT and OAuth2 for authentication and authorization.
- **Automate Deployment:** Integrate with CI/CD pipelines for continuous delivery.

## Leveraging the PDF Documentation for MicroProfile

The official MicroProfile PDF documentation provides detailed API references, usage examples, and best practices. It serves as an essential guide for:

- Understanding each specification's capabilities.
- Learning configuration options.
- Troubleshooting common issues.
- Implementing advanced features like reactive programming or server-sent events.

Downloading and thoroughly studying the PDF ensures that developers are well-equipped to utilize MicroProfile effectively in their projects.

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## Conclusion

Practical cloud-native Java development with MicroProfile empowers developers to create resilient, scalable, and maintainable microservices tailored for cloud environments. By understanding the core specifications, utilizing best practices, and leveraging the comprehensive PDF documentation, Java developers can significantly streamline their development process. The combination of MicroProfile's lightweight APIs, containerization, and orchestration integration paves the way for building modern cloud-native applications that meet the demands of today's digital landscape.

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## Additional Resources

- Official MicroProfile Documentation PDF: [Link to download]
- MicroProfile GitHub Repository: <https://github.com/eclipse/microprofile>
- Popular MicroProfile Implementations:
  - Payara Micro
  - OpenLiberty
  - Quarkus
  - Thorntail
- Community Forums and Support Channels

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By embracing practical development strategies and utilizing the detailed MicroProfile PDF documentation, Java developers can efficiently navigate the complexities of cloud-native application development, ensuring their microservices are robust, scalable, and future-proof.

## Frequently Asked Questions

### **What are the key benefits of using MicroProfile for cloud-native Java development?**

MicroProfile provides a lightweight, modular approach to building Java microservices with features like fault tolerance, configuration, health checks, and metrics, making cloud-native development more streamlined, portable, and resilient.

### **How does the 'Practical Cloud-Native Java Development with MicroProfile' PDF help developers?**

The PDF offers comprehensive guidance, best practices, architecture patterns, and practical examples to help developers effectively build, deploy, and manage Java microservices using MicroProfile in cloud environments.

### **What topics are typically covered in the MicroProfile PDF for cloud-native Java development?**

The PDF usually covers microservices architecture, MicroProfile specifications (Config, Fault Tolerance, Health, Metrics), containerization with Docker, deployment strategies, and integration with cloud platforms like Kubernetes.

### **Can I use MicroProfile with popular Java frameworks like Quarkus or OpenLiberty as per the PDF?**

Yes, the PDF often discusses integration with frameworks like Quarkus and OpenLiberty, which provide optimized MicroProfile implementations for building fast, lightweight, cloud-native Java

applications.

## **What are the best practices for designing microservices using MicroProfile, according to the PDF?**

Best practices include designing services with loose coupling, leveraging MicroProfile's features for configuration and resilience, implementing CI/CD pipelines, and deploying containers orchestrated by Kubernetes for scalability and reliability.

## **How does the PDF address testing and debugging cloud-native Java microservices?**

The PDF covers testing strategies such as unit testing, integration testing with containerized environments, and debugging tips using tools like Quarkus Dev Services, MicroProfile Health endpoints, and cloud platform diagnostics.

## **What security considerations are highlighted in the 'Practical Cloud-Native Java Development with MicroProfile' PDF?**

The PDF emphasizes implementing secure communication with MicroProfile JWT Propagation, configuring OAuth2/OpenID Connect, managing secrets securely, and adhering to best practices for API security in cloud environments.

## **Where can I find additional resources or community support after reading the PDF?**

Additional resources include the Eclipse MicroProfile community forums, GitHub repositories, official documentation, and cloud-native Java webinars and workshops referenced within the PDF for ongoing learning and support.

## **Additional Resources**

### **Practical Cloud-Native Java Development with MicroProfile PDF**

In the rapidly evolving landscape of enterprise software, cloud-native development has become a critical paradigm shift, enabling organizations to build, deploy, and scale applications efficiently and resiliently. Among the various technologies that facilitate this transition, MicroProfile has emerged as a standardized platform tailored to Java developers aiming to harness the full potential of cloud environments. The "Practical Cloud-Native Java Development with MicroProfile PDF" offers a comprehensive guide that bridges theoretical concepts with real-world implementation strategies, equipping developers to craft robust, scalable microservices architecture using Java and MicroProfile specifications.

This review delves into the core principles of microservices, the role of MicroProfile in enabling cloud-native Java applications, and practical insights into leveraging its features through PDFs—either as a reference or educational resource. We will explore how MicroProfile simplifies the development of cloud-ready Java microservices, the key specifications involved, and best practices to maximize its

benefits. By the end, readers will gain a thorough understanding of how to practically implement MicroProfile in their Java projects, supported by detailed analysis and examples.

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# **Understanding Cloud-Native Java Development**

## **What is Cloud-Native Development?**

At its core, cloud-native development refers to designing software systems that are optimized for cloud environments. These applications are inherently scalable, resilient, and manageable, leveraging cloud services such as containerization, microservices architectures, continuous deployment, and dynamic resource allocation. The primary goals are agility, automation, and operational efficiency.

Key characteristics of cloud-native applications include:

- Modularity: Breaking down monoliths into smaller, manageable microservices.
- Scalability: Ability to scale components independently based on demand.
- Resilience: Built-in fault tolerance and recovery mechanisms.
- Automation: Continuous integration and continuous deployment (CI/CD) pipelines.
- Observability: Monitoring, logging, and tracing capabilities integrated into the system.

## **Why Java in Cloud-Native Development?**

Java remains one of the most widely used programming languages in enterprise environments. Its maturity, extensive ecosystem, and stability make it a natural choice for cloud-native development. With frameworks like Spring Boot, Quarkus, and Eclipse MicroProfile, Java developers now have powerful tools to craft microservices that are lightweight, fast, and cloud-ready.

Advantages of using Java include:

- Platform Independence: Write once, run anywhere.
- Rich Ecosystem: Libraries, frameworks, and tools for various needs.
- Strong Community Support: Extensive documentation and community engagement.
- Enterprise Readiness: Proven track record in large-scale systems.

However, traditional Java EE (Enterprise Edition) implementations were often heavyweight, prompting the need for more streamlined, cloud-optimized frameworks like MicroProfile.

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# Introduction to MicroProfile: A Cloud-Native Java Platform

## What is MicroProfile?

Eclipse MicroProfile is an open-source initiative aimed at optimizing enterprise Java for microservices development. It extends the Java EE (now Jakarta EE) specifications with additional APIs and best practices specifically tailored for cloud-native applications.

Key features of MicroProfile include:

- Lightweight and modular design.
- Focused on microservices needs like configuration, fault tolerance, health checks, metrics, and security.
- Compatible with popular Java runtimes such as OpenJDK, OpenLiberty, and Quarkus.

MicroProfile's main goal is to provide a consistent, portable, and standards-based approach for building microservices, reducing vendor lock-in and enabling interoperability across different cloud platforms.

## Core Specifications of MicroProfile

MicroProfile comprises several specifications, each addressing critical aspects of cloud-native application development:

1. Config: Simplifies externalized configuration management, allowing dynamic configuration based on environment variables, property files, or other sources.
2. Fault Tolerance: Implements resilience patterns like retries, circuit breakers, bulkheads, and timeouts.
3. Health Checks: Provides endpoints to report on the health status of microservices, facilitating proactive monitoring.
4. Metrics: Enables collection of application metrics for performance monitoring and analysis.
5. OpenAPI & Swagger: Facilitates API documentation and discovery.
6. JWT Propagation: Supports secure token-based authentication across services.
7. Reactive Messaging: Enables event-driven communication via reactive streams.

Understanding these specifications is crucial for building robust, scalable, and maintainable microservices in the cloud.

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## Practical Aspects of Developing with MicroProfile

# Setting Up Your Development Environment

To start developing MicroProfile-based applications, developers need:

- Java Development Kit (JDK): Version 11 or higher is recommended.
- Build Tools: Maven or Gradle for dependency management.
- MicroProfile Runtime: Such as Eclipse OpenLiberty, Quarkus, Payara Micro, or Thorntail.
- IDEs: Eclipse, IntelliJ IDEA, or VS Code with relevant plugins.

Most MicroProfile runtimes provide a quick-start setup, enabling rapid prototyping and testing.

## Project Structure and Dependencies

A typical MicroProfile project includes:

- Annotations: For defining REST endpoints, configuration, and other services.
- Configuration Files: For externalized configuration, such as `microprofile-config.properties`.
- Runtime Libraries: MicroProfile APIs bundled with the chosen runtime.

Sample Maven dependencies for MicroProfile 4.0:

```
``xml

org.eclipse.microprofile
microprofile-api
4.0
provided

```

## Implementing MicroProfile Features

Let's explore some typical implementations:

- Creating RESTful Services: Using JAX-RS annotations (`@Path`, `@GET`, `@POST`).
- External Configuration: Leveraging `@ConfigProperty` to inject configuration values.
- Resilience Patterns: Applying `@CircuitBreaker`, `@Retry`, `@Timeout`.
- Health Checks: Implementing custom health check classes annotated with `@Readiness` or `@Liveness`.
- Metrics Collection: Using MicroProfile Metrics annotations like `@Counted`, `@Gauge`.

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# Leveraging MicroProfile PDF as a Learning and Reference Tool

## The Role of PDFs in MicroProfile Documentation

In the context of MicroProfile development, PDFs serve as valuable educational and reference materials. They often compile specifications, best practices, tutorials, and architectural guides into a portable, easily accessible format. A comprehensive PDF resource can:

- Provide step-by-step tutorials for building microservices.
- Offer detailed explanations of each MicroProfile API.
- Include code samples illustrating practical usage.
- Serve as a quick reference guide during development.

Such PDFs are particularly useful for teams and organizations aiming to standardize their microservices development practices or for individual developers seeking a structured learning path.

## Content Breakdown of a Typical MicroProfile PDF

A well-crafted MicroProfile PDF generally covers:

- Introduction to Cloud-Native Java and MicroProfile: Contextual background.
- MicroProfile Specifications Overview: Detailed explanations of each API.
- Development Workflow: Setting up environment, creating projects, deploying.
- Use Cases and Examples: Common scenarios, sample code snippets.
- Best Practices: Design patterns, security considerations, performance tuning.
- Troubleshooting: Common issues and solutions.
- Future Trends: Emerging features and the evolution of MicroProfile.

Such comprehensive documentation fosters confidence and accelerates learning, especially for Java developers transitioning to cloud-native paradigms.

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## Case Studies and Real-World Applications

### Enterprise Microservices with MicroProfile

Many large enterprises have adopted MicroProfile to modernize their legacy systems. For instance:

- Banking Sector: MicroProfile-based microservices manage account transactions, customer data, and

compliance reporting, benefiting from resilience and scalability features.

- Healthcare: Patient record systems utilize health checks and metrics to ensure high availability and compliance.

- Retail: E-commerce platforms implement product catalogs and order management microservices, leveraging configuration and API documentation tools.

## Success Factors and Challenges

Successful microservices adoption hinges on:

- Clear service boundaries.
- Robust security practices.
- Effective monitoring and logging.
- Operational automation.

Challenges include managing distributed systems complexity, ensuring consistency, and avoiding vendor lock-in. MicroProfile's standards help mitigate some of these issues by promoting portability and best practices.

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## Future Directions and Evolving Landscape

MicroProfile continues to evolve, integrating newer specifications such as reactive messaging, server-sent events, and cloud-native security enhancements. The community actively collaborates on making microservices more developer-friendly, resilient, and adaptable to emerging cloud technologies like Kubernetes and serverless.

Furthermore, integration with frameworks like Quarkus accelerates startup times and reduces memory footprints, making Java a competitive choice in serverless and edge computing scenarios.

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## Conclusion: Embracing Cloud-Native Java with MicroProfile PDFs

The shift towards cloud-native architectures necessitates tools and standards that streamline development, deployment, and management of microservices. MicroProfile stands out as a dedicated, open-source platform that equips Java developers with the necessary specifications to build resilient, scalable, and portable microservices. The availability of detailed PDFs as educational and reference resources amplifies this impact, ensuring that teams can quickly onboard, learn, and implement best practices.

By understanding the core specifications, leveraging practical implementation techniques, and

utilizing comprehensive PDFs, developers can confidently navigate the complexities of cloud-native Java

## [Practical Cloud Native Java Development With Microprofile Pdf](#)

**practical cloud native java development with microprofile pdf: Practical Cloud-Native Java Development with MicroProfile** Emily Jiang, Andrew McCright, John Alcorn, David Chan, Alasdair Nottingham, Eric Herness, 2021-09-22 Written by leading MicroProfile experts, this book provides you with best practices for building enterprise-grade cloud-native applications using MicroProfile 4.1 and running them on Open Liberty with Docker, Kubernetes, and Istio Key Features: Apply your knowledge of MicroProfile APIs to develop cloud-native applications Use MicroProfile Health to provide the startup, liveness, and readiness status of your enterprise application Build an end-to-end stock trader project and containerize it to deploy to the cloud with Istio interaction Book Description In this cloud-native era, most applications are deployed in a cloud environment that is public, private, or a combination of both. To ensure that your application performs well in the cloud, you need to build an application that is cloud native. MicroProfile is one of the most popular frameworks for building cloud-native applications, and fits well with Kubernetes. As an open standard technology, MicroProfile helps improve application portability across all of MicroProfile's implementations. Practical Cloud-Native Java Development with MicroProfile is a comprehensive guide that helps you explore the advanced features and use cases of a variety of Jakarta and MicroProfile specifications. You'll start by learning how to develop a real-world stock trader application, and then move on to enhancing the application and adding day-2 operation considerations. You'll gradually advance to packaging and deploying the application. The book demonstrates the complete process of development through to deployment and concludes by showing you how to monitor the application's performance in the cloud. By the end of this book, you will master MicroProfile's latest features and be able to build fast and efficient cloud-native applications. What you will learn Understand best practices for applying the 12-Factor methodology while building cloud-native applications Create client-server architecture using MicroProfile Rest Client and JAX-RS Configure your cloud-native application using MicroProfile Config Secure your cloud-native application with MicroProfile JWT Become well-versed with running your cloud-native applications in Open Liberty Grasp MicroProfile Open Tracing and learn how to use Jaeger to view trace spans Deploy Docker containers to Kubernetes and understand how to use ConfigMap and Secrets from Kubernetes Who this book is for This book is for Java application developers and architects looking to build efficient applications using an open standard framework that performs well in the cloud. DevOps engineers who want to understand how cloud-native applications work will also find this book useful. A basic understanding of Java, Docker, Kubernetes, and cloud is needed to get the most out of this book.

**practical cloud native java development with microprofile pdf: Practical Cloud-Native Java Development with MicroProfile** Emily Jiang, Andrew McCright, John Alcorn, David Chan, Alasdair Nottingham, 2021-09-22 Written by leading MicroProfile experts, this book provides you with best practices for building enterprise-grade cloud-native applications using MicroProfile 4.1 and running them on Open Liberty with Docker, Kubernetes, and Istio Key Features: Apply your knowledge of MicroProfile APIs to develop cloud-native applications Use MicroProfile Health to provide the startup, liveness, and readiness status of your enterprise application Build an end-to-end stock trader project and containerize it to deploy to the cloud with Istio interaction Book Description: In this cloud-native era, most applications are deployed in a cloud environment that is public, private, or a combination of both. To ensure that your application performs well in the cloud,

you need to build an application that is cloud native. MicroProfile is one of the most popular frameworks for building cloud-native applications, and fits well with Kubernetes. As an open standard technology, MicroProfile helps improve application portability across all of MicroProfile's implementations. Practical Cloud-Native Java Development with MicroProfile is a comprehensive guide that helps you explore the advanced features and use cases of a variety of Jakarta and MicroProfile specifications. You'll start by learning how to develop a real-world stock trader application, and then move on to enhancing the application and adding day-2 operation considerations. You'll gradually advance to packaging and deploying the application. The book demonstrates the complete process of development through to deployment and concludes by showing you how to monitor the application's performance in the cloud. By the end of this book, you will master MicroProfile's latest features and be able to build fast and efficient cloud-native applications. What You Will Learn: Understand best practices for applying the 12-Factor methodology while building cloud-native applications Create client-server architecture using MicroProfile Rest Client and JAX-RS Configure your cloud-native application using MicroProfile Config Secure your cloud-native application with MicroProfile JWT Become well-versed with running your cloud-native applications in Open Liberty Grasp MicroProfile Open Tracing and learn how to use Jaeger to view trace spans Deploy Docker containers to Kubernetes and understand how to use ConfigMap and Secrets from Kubernetes Who this book is for: This book is for Java application developers and architects looking to build efficient applications using an open standard framework that performs well in the cloud. DevOps engineers who want to understand how cloud-native applications work will also find this book useful. A basic understanding of Java, Docker, Kubernetes, and cloud is needed to get the most out of this book.

**practical cloud native java development with microprofile pdf: Cloud-Native Development Using Java with Eclipse MicroProfile**, 2019 Learn to build optimized cloud-native Java applications for microservices architectures with the help of Eclipse MicroProfile.

**practical cloud native java development with microprofile pdf: Cloud-Native Development Using Java with Eclipse MicroProfile** Kate Stanley, 2019

**practical cloud native java development with microprofile pdf: Beginning Cloud Native Development with MicroProfile, Jakarta EE, and Kubernetes** Tarun Telang, 2023 Get ready to develop microservices using open source Eclipse MicroProfile and Jakarta EE, and deploy them on Kubernetes/Docker. This book covers best practices for developing cloud-native applications with MicroProfile and Jakarta EE. This book introduces you to cloud-native applications and teaches you how to set up your development environment. You'll learn about the various components of MicroProfile, such as fault tolerance, config, health check, metrics, and JWT auth. You'll develop a RESTful web service made up of some microservices. You'll deploy your application on Docker and Kubernetes. After reading this book, you'll come away with the fundamentals you need to build and deploy your first cloud-native Java-based app. You will: Build your first cloud-native Java-based app with the open source MicroProfile platform, and Jakarta EE 10 APIs Develop a RESTful web service using MicroProfile and Jakarta EE Discover and explore the key components of the MicroProfile framework, such as config, metrics, health, JWT authentication, and more Deploy your cloud-native application on the Kubernetes container orchestration platform Get up to speed with other popular technologies such as Docker containers, Kubernetes clusters, and Zipkin.

**practical cloud native java development with microprofile pdf: 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

**practical cloud native java development with microprofile pdf: Hands-On Cloud-Native Applications with Java and Quarkus** Francesco Marchioni, 2019-12-13 Build robust and reliable Java applications that works on modern infrastructure, such as containers and cloud, using the new features in Quarkus 1.0 Key Features Build apps with faster boot time and low RSS memory using the latest Quarkus 1.0 features Seamlessly integrate imperative and reactive programming models to build modern Java applications Discover effective solutions for running Java on serverless apps, microservices, containers, FaaS, and the cloud Book Description Quarkus is a new Kubernetes-native framework that allows Java developers to combine the power of containers, microservices, and cloud-native to build reliable applications. The book is a development guide that will teach you how to build Java-native applications using Quarkus and GraalVM. We start by learning about the basic concepts of a cloud-native application and its advantages over standard enterprise applications. Then we will quickly move on to application development, by installing the tooling required to build our first application on Quarkus. Next, we'll learn how to create a container-native image of our application and execute it in a Platform-as-a-Service environment such as Minishift. Later, we will build a complete real-world application that will use REST and the Contexts and Dependency injection stack with a web frontend. We will also learn how to add database persistence to our application using PostgreSQL. We will learn how to work with various APIs available to Quarkus such as Camel, Eclipse MicroProfile, and Spring DI. Towards the end, we will learn advanced development techniques such as securing applications, application configuration, and working with non-blocking programming models using Vert.x. By the end of this book, you will be proficient with all the components of Quarkus and develop blazing fast applications leveraging modern technology infrastructure. What you will learn Build a native application using Quarkus and GraalVM Secure your applications using Elytron and the MicroProfile JWT extension Manage data persistence with Quarkus using PostgreSQL Use a non-blocking programming model with Quarkus Learn how to get Camel and Infinispan working in native mode Deploy an application in a Kubernetes-native environment using Minishift Discover Reactive Programming with Vert.x Who this book is for The book is for Java developers and software architects who are interested in learning a promising microservice architecture for building reliable and robust applications. Knowledge of Java, Spring Framework, and REST APIs is assumed.

**practical cloud native java development with microprofile pdf: Modernizing Enterprise Java** Markus Eisele, Natale Vinto, 2021-10-21 While containers, microservices, and distributed systems dominate discussions in the tech world, the majority of applications in use today still run monolithic architectures that follow traditional development processes. This practical book helps developers examine long-established Java-based models and demonstrates how to bring these monolithic applications successfully into the future. Relying on their years of experience modernizing applications, authors Markus Eisele and Natale Vinto walk you through the steps

necessary to update your organization's Java applications. You'll discover how to dismantle your monolithic application and move to an up-to-date software stack that works across cloud and on-premises installations. Learn cloud native application basics to understand what parts of your organization's Java-based applications and platforms need to migrate and modernize Understand how enterprise Java specifications can help you transition projects and teams Build a cloud native platform that supports effective development without falling into buzzword traps Find a starting point for your migration projects by identifying candidates and staging them through modernization steps Discover how to complement a traditional enterprise Java application with components on top of containers and Kubernetes

**practical cloud native java development with microprofile pdf: Pro Cloud Native Java EE Apps** Luqman Saeed, Ghazy Abdallah, 2022 This professional guide to Java-based cloud native apps DevOps dives deeper into building and deploying production ready cloud native apps using the increasingly popular open source Eclipse MicroProfile framework, Jakarta EE 10 APIs and the most popular Kubernetes container orchestration tool. After a quick overview of Jakarta EE and MicroProfile, Pro Cloud Native Java EE Apps starts you on your way by walking you through a cloud-native Jakarta EE-based application case study that will be forged piece-by-piece over the course of the book. Next, you'll interject dependencies and data persistence capabilities as microservices to go with the case study app that you are building. Next, you'll employ the REST API using Jakarta REST APIs and the MicroProfile RESTClient. You'll also explore ways to add resilience to your app, keep count with metrics, check on your app's health, secure your app, and test and complete your production-ready cloud-native app. Finally, you'll dive into migrating a monolith to become a production ready cloud-native app. After reading this book, you'll be able to build your own production ready cloud-native Java app using Jakarta EE and MicroProfile. You will: Build and deploy a production-ready cloud-native Java app using MicroProfile, Jakarta EE and Kubernetes Migrate a monolith app to become a cloud-native app Employ Jakarta EE APIs such as Persistence, CDI and more Leverage the MicroProfile framework Explore configurations, resilience, metrics, health, security, and more for your cloud-native apps.

**practical cloud native java development with microprofile pdf: Quarkus in Action** Martin Štefanko, Jan Martiška, 2025-02-25 Build resilient and scalable, cloud-native enterprise Java applications using the Quarkus framework. Quarkus lets you live-reload your Java code, deliver continuous background testing, and automatically provide database instances—plus tons more productivity-boosting features! Quarkus in Action quickly gets you up to speed with Quarkus by building a real-world business application. In Quarkus in Action, you will:

- Use Quarkus Dev mode to speed up and enhance Java development
- Understand how to use the Dev UI to observe and troubleshoot running applications
- Automatic background testing using the Continuous Testing feature
- New frameworks and libraries such as Quarkus Messaging, gRPC, and GraphQL
- Simplify deployment of applications into Kubernetes and OpenShift
- Automatic management of remote services such as databases and message brokers via Docker containers
- Set up observability for applications by using metrics, health checks and distributed tracing

Quarkus in Action is written by Martin Štefanko and Jan Martiška, Red Hat engineers who are both active contributors to the Quarkus project. In it, you'll learn how Quarkus works and how you can integrate it into your stack for more productive Java development. Discover what makes Quarkus different from classic enterprise Java frameworks, how Quarkus streamlines creating cloud-native applications, and makes deployment easy. Foreword by Markus Eisele. Purchase of the print book includes a free eBook in PDF and ePub formats from Manning Publications. About the technology Choose a Java framework that's as modern as your applications! Quarkus is a cloud-first framework designed for speed and cost optimization. It's Kubernetes-aware by default and includes amazing productivity features like live reloading, continuous testing, and a developer-friendly UI that lets you code fluidly without tedious setup. About the book Quarkus in Action provides a carefully designed learning path through Quarkus' key features and use cases. You'll learn hands-on by implementing a working car rental application with a cloud-native microservices design that includes Kubernetes, SQL and NoSQL

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