

Read Book Building  
Microservices: Designing Fine  
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# Building Microservices: Designing Fine Grained Systems

Microservices architectures offer  
faster change speeds, better

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scalability, and cleaner, evolvable system designs. But implementing your first microservices architecture is difficult. How do you make myriad choices, educate your team on all the technical details, and navigate the organization to a successful

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execution to maximize your chance of success? With this book, authors Ronnie Mitra and Irakli Nadareishvili provide step-by-step guidance for building an effective microservices architecture.

Architects and engineers will follow an implementation journey

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based on techniques and architectures that have proven to work for microservices systems. You'll build an operating model, a microservices design, an infrastructure foundation, and two working microservices, then put those pieces together as a single

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implementation. For anyone tasked with building microservices or a microservices architecture, this guide is invaluable. Learn an effective and explicit end-to-end microservices system design. Define teams, their responsibilities, and guidelines for

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working together Understand how to slice a big application into a collection of microservices Examine how to isolate and embed data into corresponding microservices Build a simple yet powerful CI/CD pipeline for infrastructure changes Write code

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for sample microservices Deploy a  
working microservices application  
on Amazon Web Services

What's the answer to today's  
increasingly complex web  
applications? Micro-frontends.  
Inspired by the microservices  
model, this approach lets you

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break interfaces into separate features managed by different teams of developers. With this practical guide, Luca Mezzalana shows software architects, tech leads, and software developers how to build and deliver artifacts atomically rather than use a big



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bang deployment. You'll learn how micro-frontends enable your team to choose any library or framework. This gives your organization technical flexibility and allows you to hire and retain a broad spectrum of talent. Micro-frontends also support distributed

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or colocated teams more efficiently. Pick up this book and learn how to get started with this technological breakthrough right away. Explore available frontend development architectures Learn how microservice principles apply to frontend development

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Understand the four pillars for creating a successful micro-frontend architecture Examine the benefits and pitfalls of existing micro-frontend architectures Learn principles and best practices for creating successful automation strategies Discover patterns for

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integrating micro-frontend architectures using microservices or a monolith API layer

In a microservices architecture, the whole is indeed greater than the sum of its parts. But in practice, individual microservices can inadvertently impact others

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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

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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

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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:

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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



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observability: Dependency management, API utilization, and end-to-end asset inventory Traffic management: Concurrency of systems; platform, gateway, and client-side load balancing

Annotation Over the past 10 years, distributed systems have become

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more fine-grained. From the large multi-million line long monolithic applications, we are now seeing the benefits of smaller self-contained services. Rather than heavy-weight, hard to change Service Oriented Architectures, we are now seeing systems

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consisting of collaborating microservices. Easier to change, deploy, and if required retire, organizations which are in the right position to take advantage of them are yielding significant benefits. This book takes an holistic view of the things you need to be

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cognizant of in order to pull this off. It covers just enough understanding of technology, architecture, operations and organization to show you how to move towards finer-grained systems.

Most software project problems

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are sociological, not technological.  
Peopleware is a book on managing  
software projects.

Microservices Patterns  
Patterns and Paradigms for  
Scalable, Reliable Services  
Building Microservices  
Database Internals

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Building Microservices with  
ASP.NET Core

Microservice Architecture

Designing Fine-Grained Services

by Applying Patterns

Explore the concepts and tools  
you need to discover the world

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of microservices with various  
design patterns Key Features  
Get to grips with the  
microservice architecture and  
build enterprise-ready  
microservice applications Learn  
design patterns and the best

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practices while building a  
microservice application Obtain  
hands-on techniques and tools  
to create high-performing  
microservices resilient to  
possible fails Book Description  
Microservices are a hot trend in



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the development world right now. Many enterprises have adopted this approach to achieve agility and the continuous delivery of applications to gain a competitive advantage. This

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book will take you through different design patterns at different stages of the microservice application development along with their best practices. Microservice Patterns and Best Practices

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starts with the learning of microservices key concepts and showing how to make the right choices while designing microservices. You will then move onto internal microservices application

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patterns, such as caching strategy, asynchronism, CQRS and event sourcing, circuit breaker, and bulkheads. As you progress, you'll learn the design patterns of microservices. The book will guide you on where to

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use the perfect design pattern at the application development stage and how to break monolithic application into microservices. You will also be taken through the best practices and patterns involved

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while testing, securing, and deploying your microservice application. At the end of the book, you will easily be able to create interoperable microservices, which are testable and prepared for

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optimum performance. What  
you will learn How to break  
monolithic application into  
microservices Implement  
caching strategies, CQRS and  
event sourcing, and circuit  
breaker patterns Incorporate

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different microservice design patterns, such as shared data, aggregator, proxy, and chained  
Utilize consolidate testing patterns such as integration, signature, and monkey tests  
Secure microservices with JWT,



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API gateway, and single sign on  
Deploy microservices with  
continuous integration or  
delivery, Blue-Green  
deployment Who this book is for  
This book is for architects and  
senior developers who would

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like implement microservice design patterns in their enterprise application development. The book assumes some prior programming knowledge. When it comes to choosing,

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using, and maintaining a database, understanding its internals is essential. But with so many distributed databases and tools available today, it's often difficult to understand what each one offers and how

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they differ. With this practical guide, Alex Petrov guides developers through the concepts behind modern database and storage engine internals. Throughout the book, you'll explore relevant material

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gleaned from numerous books, papers, blog posts, and the source code of several open source databases. These resources are listed at the end of parts one and two. You'll discover that the most

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significant distinctions among many modern databases reside in subsystems that determine how storage is organized and how data is distributed. This book examines: Storage engines: Explore storage

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classification and taxonomy,  
and dive into B-Tree-based and  
immutable Log Structured  
storage engines, with  
differences and use-cases for  
each Storage building blocks:  
Learn how database files are

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organized to build efficient storage, using auxiliary data structures such as Page Cache, Buffer Pool and Write-Ahead Log Distributed systems: Learn step-by-step how nodes and processes connect and build



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complex communication  
patterns Database clusters:  
Which consistency models are  
commonly used by modern  
databases and how distributed  
storage systems achieve  
consistency

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Summary Spring Microservices in Action teaches you how to build microservice-based applications using Java and the Spring platform. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub

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formats from Manning Publications. About the technology Microservices break up your code into small, distributed, and independent services that require careful forethought and design.

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Fortunately, Spring Boot and Spring Cloud simplify your microservice applications, just as the Spring Framework simplifies enterprise Java development. Spring Boot removes the boilerplate code

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involved with writing a REST-based service. Spring Cloud provides a suite of tools for the discovery, routing, and deployment of microservices to the enterprise and the cloud.

About the Book Spring

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Microservices in Action teaches you how to build microservice-based applications using Java and the Spring platform. You'll learn to do microservice design as you build and deploy your first Spring Cloud application.

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Throughout the book, carefully selected real-life examples expose microservice-based patterns for configuring, routing, scaling, and deploying your services. You'll see how Spring's intuitive tooling can

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help augment and refactor  
existing applications with micro  
services. What's Inside Core  
microservice design principles  
Managing configuration with  
Spring Cloud Config Client-side  
resiliency with Spring, Hystrix,



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and Ribbon Intelligent routing  
using Netflix Zuul Deploying  
Spring Cloud applications

About the Reader This book is  
written for developers with Java  
and Spring experience. About  
the Author John Carnell is a

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senior cloud engineer with  
twenty years of experience in  
Java. Table of contents  
Welcome to the cloud, Spring  
Building microservices with  
Spring Boot Controlling your  
configuration with Spring Cloud

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configuration server On service  
discovery When bad things  
happen: client resiliency  
patterns with Spring Cloud and  
Netflix Hystrix Service routing  
with Spring Cloud and Zuul  
Securing your microservices

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Event-driven architecture with  
Spring Cloud Stream

Distributed tracing with Spring  
Cloud Sleuth and Zipkin

Deploying your microservices

MVC and CRUD make software  
easier to write, but harder to

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change. Microservice-based architectures can help even the smallest of projects remain agile in the long term, but most tutorials meander in theory or completely miss the point of what it means to be

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microservice-based. Roll up your sleeves with real projects and learn the most important concepts of evented architectures. You'll have your own deployable, testable project and a direction for

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where to go next. Much ink has been spilled on the topic of microservices, but all of this writing fails to accurately identify what makes a system a monolith, define what microservices are, or give

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complete, practical examples, so you're probably left thinking they have nothing to offer you. You don't have to be at Google or Facebook scale to benefit from a microservice-based architecture. Microservices will



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keep even small and medium teams productive by keeping the pieces of your system focused and decoupled.

Discover the basics of message-based architectures, render the same state in different shapes

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to fit the task at hand, and learn what it is that makes something a monolith (it has nothing to do with how many machines you deploy to). Conserve resources by performing background jobs with microservices. Deploy

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specialized microservices for registration, authentication, payment processing, e-mail, and more. Tune your services by defining appropriate service boundaries. Deploy your services effectively for

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continuous integration. Master debugging techniques that work across different services. You'll finish with a deployable system and skills you can apply to your current project. Add the responsiveness and flexibility of

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microservices to your project,  
no matter what the size or  
complexity. What You Need:  
While the principles of this  
book transcend programming  
language, the code examples  
are in Node.js because

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JavaScript, for better or worse, is widely read. You'll use PostgreSQL for data storage, so familiarity with it is a plus. The books does provide Docker images to make working with PostgreSQL a bit easier, but

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extensive Docker knowledge is not required.

Building software is harder than ever. As a developer, you not only have to chase ever-changing technological trends but also need to understand the

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business domains behind the software. This practical book provides you with a set of core patterns, principles, and practices for analyzing business domains, understanding business strategy, and, most



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importantly, aligning software design with its business needs. Author Vlad Khononov shows you how these practices lead to robust implementation of business logic and help to future-proof software design

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and architecture. You'll examine the relationship between domain-driven design (DDD) and other methodologies to ensure you make architectural decisions that meet business requirements.

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You'll also explore the real-life story of implementing DDD in a startup company. With this book, you'll learn how to:  
Analyze a company's business domain to learn how the system you're building fits its

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competitive strategy Use DDD's strategic and tactical tools to architect effective software solutions that address business needs Build a shared understanding of the business domains you encounter

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Decompose a system into  
bounded contexts Coordinate  
the work of multiple teams  
Gradually introduce DDD to  
brownfield projects  
Building Microservices with  
.NET Core 2.0

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Fundamentals of Software  
Architecture  
Building Standardized Systems  
Across an Engineering  
Organization  
Best Practices for Designing,  
Implementing, and Maintaining

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A practical guide to revealing  
anti-patterns and architectural  
pitfalls to avoid microservices  
fallacies

Develop event-driven, scalable,  
and reactive microservices with

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real-time monitoring

Peopleware

***Microservices can have a  
positive impact on your  
enterprise—just ask Amazon  
and Netflix—but you can fall  
into many traps if you don't***



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***approach them in the right way. This practical guide covers the entire microservices landscape, including the principles, technologies, and methodologies of this unique,***

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***modular style of system building. You'll learn about the experiences of organizations around the globe that have successfully adopted microservices. In three parts, this book explains how these***

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***services work and what it means to build an application the Microservices Way. You'll explore a design-based approach to microservice architecture with guidance for implementing various***

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***elements. And you'll get a set of recipes and practices for meeting practical, organizational, and cultural challenges to microservice adoption. Learn how microservices can help you***

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***drive business objectives  
Examine the principles,  
practices, and culture that  
define microservice  
architectures Explore a model  
for creating complex systems  
and a design process for***

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***building a microservice  
architecture Learn the  
fundamental design concepts  
for individual microservices  
Delve into the operational  
elements of a microservices  
architecture, including***

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***containers and service  
discovery Discover how to  
handle the challenges of  
introducing microservice  
architecture in your  
organization  
In the race to compete in***

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***today's fast-moving markets, large enterprises are busy adopting new technologies for creating new products, processes, and business models. But one obstacle on the road to digital***



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***transformation is placing too much emphasis on technology, and not enough on the types of processes technology enables. What if different lines of business could build their own services and***

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***applications—and decision-making was distributed rather than centralized? This report explores the concept of a digital business platform as a way of empowering individual business sectors to act on data***

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***in real time. Much innovation in a digital enterprise will increasingly happen at the edge, whether it involves business users (from marketers to data scientists) or IoT devices. To facilitate the***

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***process, your core IT team can provide these sectors with the digital tools they need to innovate quickly. This report explores: Key cultural and organizational changes for developing business***

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***capabilities through cross-functional product teams A platform for integrating applications, data sources, business partners, clients, mobile apps, social networks, and IoT devices Creating***

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***internal API programs for  
building innovative edge  
services in low-code or no-  
code environments Tools  
including Integration Platform  
as a Service, Application  
Platform as a Service, and***

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***Integration Software as a  
Service The challenge of  
integrating microservices and  
serverless architectures Event-  
driven architectures for  
processing and reacting to  
events in real time You'll also***

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***learn about a complete  
pervasive integration solution  
as a core component of a  
digital business platform to  
serve every audience in your  
organization.***

***There are no easy decisions in***



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***software architecture. Instead, there are many hard parts--difficult problems or issues with no best practices--that force you to choose among various compromises. With this book,***

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***you'll learn how to think  
critically about the trade-offs  
involved with distributed  
architectures. Architecture  
veterans and practicing  
consultants Neal Ford, Mark  
Richards, Pramod Sadalage,***

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***and Zhamak Dehghani discuss strategies for choosing an appropriate architecture. By interweaving a story about a fictional group of technology professionals--the Sysops Squad--they examine***

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***everything from how to  
determine service granularity,  
manage workflows and  
orchestration, manage and  
decouple contracts, and  
manage distributed  
transactions to how to***

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***optimize operational characteristics, such as scalability, elasticity, and performance. By focusing on commonly asked questions, this book provides techniques to help you discover and weigh***

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***the trade-offs as you confront  
the issues you face as an  
architect. Analyze trade-offs  
and effectively document your  
decisions Make better  
decisions regarding service  
granularity Understand the***

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***complexities of breaking apart  
monolithic applications***

***Manage and decouple  
contracts between services***

***Handle data in a highly  
distributed architecture Learn  
patterns to manage workflow***

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***and transactions when  
breaking apart applications  
Every day, companies struggle  
to scale critical applications.  
As traffic volume and data  
demands increase, these  
applications become more***



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***complicated and brittle,  
exposing risks and  
compromising availability.  
With the popularity of  
software as a service, scaling  
has never been more  
important. Updated with an***

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***expanded focus on modern architecture paradigms such as microservices and cloud computing, this practical guide provides techniques for building systems that can handle huge quantities of***

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***traffic, data, and demand—without affecting the quality your customers expect. Architects, managers, and directors in engineering and operations organizations will learn how to build applications***

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***at scale that run more smoothly and reliably to meet the needs of customers. Learn how scaling affects the availability of your services, why that matters, and how to improve it Dive into a modern***

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***service-based application  
architecture that ensures high  
availability and reduces the  
effects of service failures  
Explore the Single Team  
Owned Service Architecture  
paradigm (STOSA)—a model***

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***for scaling your development organization in tandem with your application Understand, measure, and mitigate risk in your systems Use the cloud to build highly scalable applications***

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***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***

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***task that represents a small business capability. These microservices can be developed in any programming language. They communicate with each other using language-neutral protocols,***



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***such as Representational State  
Transfer (REST), or messaging  
applications, such as IBM® MQ  
Light. This IBM Redbooks®  
publication gives a broad  
understanding of this  
increasingly popular***

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***architectural style, and provides some real-life examples of how you can develop applications using the microservices approach with IBM Bluemix™. The source code for all of these sample***

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**scenarios can be found on  
GitHub (<https://github.com/>).  
The book also presents some  
case studies from IBM  
products. We explain the  
architectural decisions made,  
our experiences, and lessons**

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***learned when redesigning  
these products using the  
microservices approach.  
Information technology (IT)  
professionals interested in  
learning about microservices  
and how to develop or***

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***redesign an application in  
Bluemix using microservices  
can benefit from this book.***

***Fowler***

***Microservices in .NET, Second  
Edition***

***Practical Microservices***

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***Pro Spring Boot 2  
A Practical Guide  
Microservices in Action***

The practice of enterprise application development has benefited from the emergence of many new enabling

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technologies. Multi-tiered object-oriented platforms, such as Java and .NET, have become commonplace. These new tools and technologies are capable of building powerful applications, but they are not easily implemented. Common failures in enterprise applications often occur

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because their developers do not understand the architectural lessons that experienced object developers have learned. Patterns of Enterprise Application Architecture is written in direct response to the stiff challenges that face enterprise application developers. The author, noted object-



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oriented designer Martin Fowler, noticed that despite changes in technology--from Smalltalk to CORBA to Java to .NET--the same basic design ideas can be adapted and applied to solve common problems. With the help of an expert group of contributors, Martin distills over forty recurring

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solutions into patterns. The result is an indispensable handbook of solutions that are applicable to any enterprise application platform. This book is actually two books in one. The first section is a short tutorial on developing enterprise applications, which you can read from start to finish to understand

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the scope of the book's lessons. The next section, the bulk of the book, is a detailed reference to the patterns themselves. Each pattern provides usage and implementation information, as well as detailed code examples in Java or C#. The entire book is also richly illustrated with UML diagrams to

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further explain the concepts. Armed with this book, you will have the knowledge necessary to make important architectural decisions about building an enterprise application and the proven patterns for use when building them. The topics covered include .  
Dividing an enterprise application into

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layers · The major approaches to organizing business logic · An in-depth treatment of mapping between objects and relational databases · Using Model-View-Controller to organize a Web presentation · Handling concurrency for data that spans multiple transactions · Designing distributed object interfaces

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Can a system be considered truly reliable if it isn't fundamentally secure? Or can it be considered secure if it's unreliable? Security is crucial to the design and operation of scalable systems in production, as it plays an important part in product quality, performance, and availability. In this book, experts

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from Google share best practices to help your organization design scalable and reliable systems that are fundamentally secure. Two previous O'Reilly books from Google—Site Reliability Engineering and The Site Reliability Workbook—demonstrated how and why a commitment to the entire service

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lifecycle enables organizations to successfully build, deploy, monitor, and maintain software systems. In this latest guide, the authors offer insights into system design, implementation, and maintenance from practitioners who specialize in security and reliability. They also discuss how building and



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adopting their recommended best practices requires a culture that's supportive of such change. You'll learn about secure and reliable systems through: Design strategies  
Recommendations for coding, testing, and debugging practices  
Strategies to prepare for, respond to, and recover

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from incidents Cultural best practices that help teams across your organization collaborate effectively The common patterns and practices of the microservice architecture and their application using the Clojure programming language. Key Features Relevance of the microservice

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architecture and benefits of Clojure's functional and simple features to implement it. Learn best practices and common principles to avoid common pitfalls while developing microservices. Learn how to use Pedestal to build your next microservices, secure them using JWT, and monitor them using the ELK

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stack Book Description The microservice architecture is sweeping the world as the de facto pattern with which to design and build scalable, easy-to-maintain web applications. This book will teach you common patterns and practices, and will show you how to apply these using the Clojure

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programming language. This book will teach you the fundamental concepts of architectural design and RESTful communication, and show you patterns that provide manageable code that is supportable in development and at scale in production. We will provide you with examples of how to put these concepts

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and patterns into practice with Clojure. This book will explain and illustrate, with practical examples, how teams of all sizes can start solving problems with microservices. You will learn the importance of writing code that is asynchronous and non-blocking and how Pedestal helps us do this. Later, the

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book explains how to build Reactive microservices in Clojure that adhere to the principles underlying the Reactive Manifesto. We finish off by showing you various ways to monitor, test, and secure your microservices. By the end, you will be fully capable of setting up, modifying, and deploying a

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microservice with Clojure and Pedestal.  
What you will learn Explore the pros  
and cons of monolithic and microservice  
architectures Use Clojure to effectively  
build a reallife application using  
Microservices Gain practical knowledge  
of the Clojure Pedestal framework and  
how to use it to build Microservices



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Microservices: Patterns and  
Applications  
Microservices are the next  
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Sourcing\* Bulk Heads\* Circuit  
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tactics needs to make this work for you. It is not as easy as it would seem and you will understand why after reading this book. Microservice Technologies You'll learn about what technologies you need to use and understand for successful Microservices.



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architectural decision, you will understand the details by reading this book. Most importantly you will understand how Microservices is what SOA had promised and never delivered. Author: Lucas Krause Lucas has been in the technology industry as a consultant, contractor, architect, engineer, and

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manager and understands and has used Microservices successfully to solve his client problems. Philosophy of Microservices You'll learn about what the philosophy of Microservices is and why this is important. It is critical to understand the philosophy as that is what makes Microservices work at so

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complex Spring applications and microservices out of the box, with minimal concern over things like configurations. This revised book will show you how to fully leverage the Spring Boot 2 technology and how to apply it to create enterprise ready applications that just work. It will also

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With examples in Java

Software Architecture: The Hard Parts

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Microservices

A Deep Dive into How Distributed Data  
Systems Work

Over the past 10 years,  
distributed systems have become  
more fine-grained. From the large  
multi-million line long monolithic  
applications, we are now seeing

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the benefits of smaller self-contained services. Rather than heavy-weight, hard to change Service Oriented Architectures, we are now seeing systems consisting of collaborating microservices. Easier to change, deploy, and if required retire,

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organizations which are in the right position to take advantage of them are yielding significant benefits. This book takes an holistic view of the things you need to be cognizant of in order to pull this off. It covers just enough understanding of



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technology, architecture, operations and organization to show you how to move towards finer-grained systems.

Microservices have many advantages: Efficiently implementing more features, bringing software into production

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faster, robustness and easy scalability are among them. But implementing a microservices architecture and selecting the necessary technologies are difficult challenges. This book shows microservices recipes that architects can customize and

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combine into a microservices menu. In this way, the implementation of microservices can be individually adapted to the requirements of the project. Eberhard Wolff introduces microservices, self-contained systems, micro- and macro-

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architecture and the migration to microservices. The second part shows the microservices recipes: Basic technologies such as Docker or PaaS, frontend integration with links, JavaScript or ESI (Edge Side Includes). This is followed by asynchronous microservices with

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Apache Kafka or REST / Atom. In the synchronous approaches, the book discusses REST with the Netflix stack, Consul, PaaS with Cloud Foundry, and Kubernetes. Finally, operations is discussed: Log Analysis with Elasticsearch and Kibana, Monitoring with

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Prometheus, and tracing with Zipkin. For each recipe there are suggestions for variations and combinations. Readers can experience all technologies hands-on with a demo project on GitHub. The outlook picks up on the operation of microservices

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and also shows how the reader can start with microservices in concrete terms. The book provides the technical tools to implement a microservices architecture. Demo projects and suggestions for self-study will complete the book.

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Organizations today often struggle to balance business requirements with ever-increasing volumes of data. Additionally, the demand for leveraging large-scale, real-time data is growing rapidly among the most competitive digital industries.



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Conventional system architectures may not be up to the task. With this practical guide, you'll learn how to leverage large-scale data usage across the business units in your organization using the principles of event-driven microservices.

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Author Adam Bellemare takes you through the process of building an event-driven microservice-powered organization. You'll reconsider how data is produced, accessed, and propagated across your organization. Learn powerful yet simple patterns for unlocking

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the value of this data. Incorporate event-driven design and architectural principles into your own systems. And completely rethink how your organization delivers value by unlocking near-real-time access to data at scale. You'll learn: How to leverage

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event-driven architectures to  
deliver exceptional business  
value The role of microservices in  
supporting event-driven designs  
Architectural patterns to ensure  
success both within and between  
teams in your organization  
Application patterns for

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developing powerful event-driven microservices Components and tooling required to get your microservice ecosystem off the ground

The software development ecosystem is constantly changing, providing a constant stream of

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new tools, frameworks, techniques, and paradigms. Over the past few years, incremental developments in core engineering practices for software development have created the foundations for rethinking how architecture changes over time,

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along with ways to protect important architectural characteristics as it evolves. This practical guide ties those parts together with a new way to think about architecture and time. Your one-stop guide to the common patterns and practices,

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showing you how to apply these using the Go programming language About This Book This short, concise, and practical guide is packed with real-world examples of building microservices with Go It is easy to read and will benefit smaller



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teams who want to extend the functionality of their existing systems Using this practical approach will save your money in terms of maintaining a monolithic architecture and demonstrate capabilities in ease of use Who This Book Is For You should have

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a working knowledge of programming in Go, including writing and compiling basic applications. However, no knowledge of RESTful architecture, microservices, or web services is expected. If you are looking to apply techniques to

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your own projects, taking your first steps into microservice architecture, this book is for you. What You Will Learn Plan a microservice architecture and design a microservice Write a microservice with a RESTful API and a database Understand the

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common idioms and common patterns in microservices architecture Leverage tools and automation that helps microservices become horizontally scalable Get a grounding in containerization with Docker and Docker-Compose,

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which will greatly accelerate your development lifecycle Manage and secure Microservices at scale with monitoring, logging, service discovery, and automation Test microservices and integrate API tests in Go In Detail Microservice architecture is sweeping the

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world as the de facto pattern to build web-based applications. Golang is a language particularly well suited to building them. Its strong community, encouragement of idiomatic style, and statically-linked binary artifacts make integrating it with

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other technologies and managing microservices at scale consistent and intuitive. This book will teach you the common patterns and practices, showing you how to apply these using the Go programming language. It will teach you the fundamental

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concepts of architectural design and RESTful communication, and show you patterns that provide manageable code that is supportable in development and at scale in production. We will provide you with examples on how to put these concepts and



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patterns into practice with Go. Whether you are planning a new application or working in an existing monolith, this book will explain and illustrate with practical examples how teams of all sizes can start solving problems with microservices. It

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will help you understand Docker and Docker-Compose and how it can be used to isolate microservice dependencies and build environments. We finish off by showing you various techniques to monitor, test, and secure your microservices. By the

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end, you will know the benefits of system resilience of a microservice and the advantages of Go stack. Style and approach The step-by-step tutorial focuses on building microservices. Each chapter expands upon the previous one, teaching you the

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main skills and techniques  
required to be a successful  
microservice practitioner.

Build Event-Driven Architectures  
with Event Sourcing and CQRS  
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The Big Ideas Behind Reliable,  
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Designing, Developing, and  
Deploying  
Spring Microservices in Action  
Microservices with Clojure

*One of the biggest challenges for*

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*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*

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*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*

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*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*



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*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*

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*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,*

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*including organizational sprawl and  
technical debt*

*Understand the key challenges and  
solutions around building  
microservices in the enterprise  
application environment. This book  
provides a comprehensive*

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*understanding of microservices  
architectural principles and how to  
use microservices in real-world  
scenarios. Architectural challenges  
using microservices with service  
integration and API management are  
presented and you learn how to*

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*eliminate the use of centralized integration products such as the enterprise service bus (ESB) through the use of composite/integration microservices. Concepts in the book are supported with use cases, and emphasis is put on the reality that*

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*most of you are implementing in a  
“brownfield” environment in which  
you must implement microservices  
alongside legacy applications with  
minimal disruption to your business.  
Microservices for the Enterprise  
covers state-of-the-art techniques*

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*around microservices messaging, service development and description, service discovery, governance, and data management technologies and guides you through the microservices design process. Also included is the importance of organizing services as*

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*core versus atomic, composite versus integration, and API versus edge, and how such organization helps to eliminate the use of a central ESB and expose services through an API gateway. What You'll Learn Design and develop microservices*



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*architectures with confidence Put into  
practice the most modern techniques  
around messaging technologies Apply  
the Service Mesh pattern to overcome  
inter-service communication  
challenges Apply battle-tested  
microservices security patterns to*

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*address real-world scenarios Handle  
API management, decentralized data  
management, and observability Who  
This Book Is For Developers and  
DevOps engineers responsible for  
implementing applications around a  
microservices architecture, and*

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*architects and analysts who are  
designing such systems*

*Summary Microservices in Action is a  
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deploying microservice-based  
applications. Written for developers  
and architects with a solid grasp of*

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*service-oriented development, it  
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microservices into production.*

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improving infrastructure, and making  
the most out of your dev teams.*

*Microservices are easier to write,  
scale, and maintain than traditional  
enterprise applications because they're  
built as a system of independent*

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overview of microservice architecture  
Building a delivery pipeline Best  
practices for designing multi-service  
transactions and queries Deploying*



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microservices About the Reader*

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GCP. About the Author Morgan  
Bruce and Paulo A. Pereira are*

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microservices for continuous delivery  
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as a system. Integrating new  
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like monitoring, logging, and security.  
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author Christian Horsdal is an  
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*projects from large-scale microservice systems to tiny embedded systems.*

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*Deploying a microservice to*

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*Kubernetes PART 2 BUILDING*

*MICROSERVICES 4 Identifying and  
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microservices PART 3 HANDLING*

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*CROSS-CUTTING CONCERNS:*

*BUILDING A REUSABLE*

*MICROSERVICE PLATFORM 9*

*Cross-cutting concerns: Monitoring  
and logging 10 Securing microservice-  
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*platform PART 4 BUILDING*

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*strategically gain further value to  
keep your code base simple, focusing  
on what is more important rather  
than on messy asynchronous calls.*

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with Microsoft Azure Service Fabric  
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*monolithic applications and SOA*

*Learn Docker and Azure API*

*management Define a service*

*interface and implement APIs using*

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*them using reactive extensions Who  
this book is for This book is for .NET  
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and understand the microservices  
architecture and implement it in their  
.NET Core applications. It's ideal for  
developers who are completely new to*

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*microservices or just have a theoretical understanding of this architectural approach and want to gain a practical perspective in order to better manage application complexities.*

*Monolith to Microservices*

*Page 227/327*

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Applications*

*Microservices for the Enterprise  
Productive Projects and Teams*

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**Threads are a  
fundamental part of the  
Java platform. As  
multicore processors**

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**become the norm, using  
concurrency effectively  
becomes essential for  
building high-  
performance  
applications. Java SE 5  
and 6 are a huge step**

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**forward for the  
development of  
concurrent applications,  
with improvements to the  
Java Virtual Machine to  
support high-  
performance, highly**

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**scalable concurrent  
classes and a rich set of  
new concurrency building  
blocks. In Java  
Concurrency in Practice ,  
the creators of these new  
facilities explain not only**



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**how they work and how  
to use them, but also the  
motivation and design  
patterns behind them.  
However, developing,  
testing, and debugging  
multithreaded programs**

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**can still be very difficult;  
it is all too easy to create  
concurrent programs that  
appear to work, but fail  
when it matters most: in  
production, under heavy  
load. Java Concurrency in**

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are both correct and  
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the concurrency building  
blocks in**

**java.util.concurrent**

**Performance optimization**

**dos and don'ts Testing**

**concurrent programs**

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atomic variables,  
nonblocking algorithms,  
and the Java Memory  
Model**

**At a time when nearly  
every vertical, regardless**

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**of domain, seems to need software running in the cloud to make money, microservices provide the agility and drastically reduced time to market you require. This hands-**



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building powerful and  
robust services. Building  
microservices isn't about  
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framework or  
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**it's about building applications that thrive in elastically scaling environments that don't have host affinity, and that can start and stop at a moment's notice. This**

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**practical book guides you  
through the process.**

**Learn test-driven and API-  
first development  
concepts Communicate  
with other services by  
creating and consuming**

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**backing services such as  
databases and queues  
Build a microservice that  
depends on an external  
data source Learn about  
event sourcing, the event-  
centric approach to**

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Core to build web  
applications designed to  
thrive in the cloud Build a  
service that consumes, or  
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services Create services**

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configuration Explore  
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**regularly place software architect in the top 10 best jobs, yet no real guide exists to help developers become architects. Until now. This book provides the**



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**first comprehensive  
overview of software  
architecture's many  
aspects. Aspiring and  
existing architects alike  
will examine architectural  
characteristics,**

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**architectural patterns,  
component  
determination,  
diagramming and  
presenting architecture,  
evolutionary architecture,  
and many other topics.**

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**Mark Richards and Neal  
Ford—hands-on  
practitioners who have  
taught software  
architecture classes  
professionally for  
years—focus on**

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**architecture principles  
that apply across all  
technology stacks. You'll  
explore software  
architecture in a modern  
light, taking into account  
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**past decade. This book  
examines: Architecture  
patterns: The technical  
basis for many  
architectural decisions  
Components:  
Identification, coupling,**

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**cohesion, partitioning,  
and granularity Soft  
skills: Effective team  
management, meetings,  
negotiation,  
presentations, and more  
Modernity: Engineering**

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**practices and operational  
approaches that have  
changed radically in the  
past few years  
Architecture as an  
engineering discipline:  
Repeatable results,**

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**metrics, and concrete  
valuations that add rigor  
to software architecture  
Develop microservice-  
based enterprise  
applications with expert  
guidance to avoid failures**

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**and technological debt  
with the help of real-  
world examples Key  
FeaturesImplement the  
right microservices  
adoption strategy to  
transition from monoliths**

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**to microservices** Explore  
**real-world use cases that**  
**explain anti-patterns and**  
**alternative practices in**  
**microservices**  
**development** Discover  
**proven recommendations**

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**for avoiding architectural  
mistakes when designing  
microservicesBook  
Description Microservices  
have been widely  
adopted for designing  
distributed enterprise**

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**apps that are flexible,  
robust, and fine-grained  
into services that are  
independent of each  
other. There has been a  
paradigm shift where  
organizations are now**

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**either building new apps  
on microservices or  
transforming existing  
monolithic apps into  
microservices-based  
architecture. This book  
explores the importance**

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**of anti-patterns and the need to address flaws in them with alternative practices and patterns. You'll identify common mistakes caused by a lack of understanding when**

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**implementing  
microservices and cover  
topics such as  
organizational readiness  
to adopt microservices,  
domain-driven design,  
and resiliency and**

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**scalability of  
microservices. The book  
further demonstrates the  
anti-patterns involved in  
re-platforming brownfield  
apps and designing  
distributed data**

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**architecture. You'll also focus on how to avoid communication and deployment pitfalls and understand cross-cutting concerns such as logging, monitoring, and security.**

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**Finally, you'll explore testing pitfalls and establish a framework to address isolation, autonomy, and standardization. By the end of this book, you'll**

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**have understood critical mistakes to avoid while building microservices and the right practices to adopt early in the product life cycle to ensure the success of a**

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**microservices initiative.**

**What you will**

**learnDiscover the**

**responsibilities of**

**different individuals**

**involved in a**

**microservices**

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**initiative**  
**Avoid the**  
**common mistakes in**  
**architecting**  
**microservices for**  
**scalability and**  
**resiliency**  
**Understand the**  
**importance of domain-**

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**driven design when  
developing  
microservices** Identify the  
**common pitfalls involved  
in migrating monolithic  
applications to  
microservices** Explore

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**communication  
strategies, along with  
their potential drawbacks  
and alternativesDiscover  
the importance of  
adopting governance,  
security, and**

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**monitoring**  
**Understand**  
**the role of CI/CD and**  
**testing**  
**Who this book is**  
**for**  
**This practical**  
**microservices book is for**  
**software architects,**  
**solution architects, and**



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**developers involved in  
designing microservices  
architecture and its  
development, who want  
to gain insights into  
avoiding pitfalls and  
drawbacks in distributed**

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**applications, and save  
time and money that  
might otherwise get  
wasted if microservices  
designs fail. Working  
knowledge of  
microservices is assumed**

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**to get the most out of  
this book.**

**Data is at the center of  
many challenges in  
system design today.**

**Difficult issues need to be  
figured out, such as**

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**scalability, consistency,  
reliability, efficiency, and  
maintainability. In  
addition, we have an  
overwhelming variety of  
tools, including relational  
databases, NoSQL**

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**datastores, stream or batch processors, and message brokers. What are the right choices for your application? How do you make sense of all these buzzwords? In this**

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**practical and  
comprehensive guide,  
author Martin Kleppmann  
helps you navigate this  
diverse landscape by  
examining the pros and  
cons of various**

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**technologies for  
processing and storing  
data. Software keeps  
changing, but the  
fundamental principles  
remain the same. With  
this book, software**

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**engineers and architects will learn how to apply those ideas in practice, and how to make full use of data in modern applications. Peer under the hood of the systems**



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**you already use, and  
learn how to use and  
operate them more  
effectively Make informed  
decisions by identifying  
the strengths and  
weaknesses of different**

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**tools Navigate the trade-  
offs around consistency,  
scalability, fault  
tolerance, and complexity  
Understand the  
distributed systems  
research upon which**

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**modern databases are  
built Peek behind the  
scenes of major online  
services, and learn from  
their architectures  
Transitioning monolithic  
architectures using**

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**microservices with .NET  
Core 2.0 using C# 7.0,  
2nd Edition**

**An Engineering Approach  
Aligning Principles,  
Practices, and Culture  
Microservices: Up and**

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**Running**

**Embracing Microservices**

**Design**

**Production-Ready**

**Microservices**

**Building Micro-Frontends**

Building Microservices Designing

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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

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from author and microservice  
architecture pioneer Chris  
Richardson A pragmatic approach  
to the benefits and the drawbacks  
of microservices architecture Solve  
service decomposition, transaction



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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

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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

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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

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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

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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

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Developing production-ready  
services Deploying microservices  
Refactoring to microservices  
The Most Complete, Practical, and  
Actionable Guide to Microservices  
Going beyond mere theory and  
marketing hype, Eberhard Wolff



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presents all the knowledge you need to capture the full benefits of this emerging paradigm. He illuminates microservice concepts, architectures, and scenarios from a technology-neutral standpoint, and demonstrates how to implement

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them with today's leading technologies such as Docker, Java, Spring Boot, the Netflix stack, and Spring Cloud. The author fully explains the benefits and tradeoffs associated with microservices, and guides you through the entire

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project lifecycle: development, testing, deployment, operations, and more. You'll find best practices for architecting microservice-based systems, individual microservices, and nanoservices, each illuminated with pragmatic examples. The

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author supplements opinions based on his experience with concise essays from other experts, enriching your understanding and illuminating areas where experts disagree. Readers are challenged to experiment on their own the

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concepts explained in the book to  
gain hands-on experience.

Discover what microservices are,  
and how they differ from other  
forms of modularization Modernize  
legacy applications and efficiently  
build new systems Drive more

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value from continuous delivery with  
microservices Learn how  
microservices differ from SOA  
Optimize the microservices project  
lifecycle Plan, visualize, manage,  
and evolve architecture Integrate  
and communicate among

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Spring Cloud Explore nanoservices  
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Understand microservices' impact  
on teams, technical leaders,  
product owners, and stakeholders



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understanding of key issues in creating or migrating toward microservices, and exactly what it will take to transform their plans into reality.

Distributed systems have become more fine-grained in the past 10

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years, shifting from code-heavy monolithic applications to smaller, self-contained microservices. But developing these systems brings its own set of headaches. With lots of examples and practical advice, this book takes a holistic view of the

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topics that system architects and administrators must consider when building, managing, and evolving microservice architectures.

Microservice technologies are moving quickly. Author Sam Newman provides you with a firm

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grounding in the concepts while diving into current solutions for modeling, integrating, testing, deploying, and monitoring your own autonomous services. You'll follow a fictional company throughout the book to learn how building a

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incremental approach when  
splitting monolithic codebases  
Deploy individual microservices  
through continuous integration  
Examine the complexities of testing  
and monitoring distributed services  
Manage security with user-to-

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service and service-to-service  
models Understand the challenges  
of scaling microservice  
architectures

How do you detangle a monolithic  
system and migrate it to a  
microservice architecture? How do



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you do it while maintaining business-as-usual? As a companion to Sam Newman's extremely popular Building Microservices, this new book details a proven method for transitioning an existing monolithic

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system to a microservice architecture. With many illustrative examples, insightful migration patterns, and a bevy of practical advice to transition your monolith enterprise into a microservice operation, this practical guide

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covers multiple scenarios and strategies for a successful migration, from initial planning all the way through application and database decomposition. You'll learn several tried and tested patterns and techniques that you

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can use as you migrate your existing architecture. Ideal for organizations looking to transition to microservices, rather than rebuild. Helps companies determine whether to migrate, when to migrate, and where to begin.

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application decomposition, including several architectural refactoring patterns Delves into details of database decomposition, including the impact of breaking referential and transactional integrity, new failure modes, and

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Flexible Software Architecture  
Support Constant Change  
Designing Distributed Systems  
Six years ago, Infrastructure as  
Code was a new concept. Today,  
as even banks and other



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change and raise the bar of  
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based platforms Working with  
infrastructure stacks: Learn how

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elements

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Building Event-Driven

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