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Get to grips with key IoT aspects along with modern trends, architectures, and technologies that support IoT solutions, such as cloud computing, modern app architecture paradigms, and data analytics

Key Features

- Understand the big picture of designing production-grade IoT solutions from an industry expert
- Get up and running with the development and designing aspects of the Internet of Things
- Solve business problems specific to your domain using different IoT platforms and technologies

Book Description

With the rising demand for and recent enhancements in IoT, a developer with sound knowledge of IoT is the need of the hour. This book will help you design, build, and operate large-scale E2E IoT solutions to transform your business and products, increase revenue, and reduce operational costs. Starting with an overview of how IoT technologies can help you solve your business problems, this book will be a useful guide to helping you implement end-to-end IoT solution architecture. You'll learn to select IoT devices; real-time operating systems; IoT Edge covering Edge location, software, and hardware; and the best IoT connectivity for your IoT solution. As you progress, you'll work with IoT device management, IoT data analytics, IoT platforms, and put these components to work as part of your IoT solution. You'll also be able to build IoT backend cloud from scratch by leveraging the modern app architecture paradigms and cloud-native technologies such as containers and microservices. Finally, you'll discover best practices for different operational excellence pillars, including high availability, resiliency, reliability, security, cost optimization, and high performance, which should be applied for large-scale production-grade IoT solutions. By the end of this IoT book, you'll be confident in designing, building, and operating IoT solutions. What you will learn

- Understand the detailed anatomy of IoT solutions and explore their building blocks
- Explore IoT connectivity options and protocols used in designing IoT solutions
- Understand the value of IoT platforms in building IoT solutions
- Explore real-time operating systems used in microcontrollers
- Automate device administration tasks with IoT device management
- Master different architecture paradigms and decisions in IoT solutions
- Build and gain insights from IoT analytics solutions
- Get an overview of IoT solution operational excellence pillars

Who this book is for This book is for E2E solution architects, systems and technical architects, and IoT developers looking to design, build, and operate E2E IoT applications and solutions. Basic knowledge of cloud computing, software engineering, and distributed system design will help you get the most out of this book.

This handbook offers comprehensive coverage of recent advancements in Big Data technologies and related paradigms. Chapters are authored by international leading experts in the field, and have been reviewed and revised for maximum reader value. The volume consists of twenty-five chapters organized into four main parts. Part one covers the fundamental concepts of Big Data tech-

nologies including data curation mechanisms, data models, storage models, programming models and programming platforms. It also dives into the details of implementing Big SQL query engines and big stream processing systems. Part Two focuses on the semantic aspects of Big Data management including data integration and exploratory ad hoc analysis in addition to structured querying and pattern matching techniques. Part Three presents a comprehensive overview of large scale graph processing. It covers the most recent research in large scale graph processing platforms, introducing several scalable graph querying and mining mechanisms in domains such as social networks. Part Four details novel applications that have been made possible by the rapid emergence of Big Data technologies such as Internet-of-Things (IOT), Cognitive Computing and SCADA Systems. All parts of the book discuss open research problems, including potential opportunities, that have arisen from the rapid progress of Big Data technologies and the associated increasing requirements of application domains. Designed for researchers, IT professionals and graduate students, this book is a timely contribution to the growing Big Data field. Big Data has been recognized as one of leading emerging technologies that will have a major contribution and impact on the various fields of science and varies aspect of the human society over the coming decades. Therefore, the content in this book will be an essential tool to help readers understand the development and future of the field.

The instant New York Times bestseller about humanity's place in the universe—and how we understand it. “Vivid...impressive....Splendidly informative.”—The New York Times “Succeeds spectacularly.”—Science “A tour de force.”—Salon Already internationally acclaimed for his elegant, lucid writing on the most challenging notions in modern physics, Sean Carroll is emerging as one of the greatest humanist thinkers of his generation as he brings his extraordinary intellect to bear not only on Higgs bosons and extra dimensions but now also on our deepest personal questions: Where are we? Who are we? Are our emotions, our beliefs, and our hopes and dreams ultimately meaningless out there in the void? Do human purpose and meaning fit into a scientific worldview? In short chapters filled with intriguing historical anecdotes, personal asides, and rigorous exposition, readers learn the difference between how the world works at the quantum level, the cosmic level, and the human level—and then how each connects to the other. Carroll's presentation of the principles that have guided the scientific revolution from Darwin and Einstein to the origins of life, consciousness, and the universe is dazzlingly unique. Carroll shows how an avalanche of discoveries in the past few hundred years has changed our world and what really matters to us. Our lives are dwarfed like never before by the immensity of space and time, but they are redeemed by our capacity to comprehend it and give it meaning. The Big Picture is an unprecedented scientific worldview, a tour de force that will sit on shelves alongside

the works of Stephen Hawking, Carl Sagan, Daniel Dennett, and E. O. Wilson for years to come.

JUnit in Action, Third Edition has been completely rewritten for this release. The book is full of examples that demonstrate JUnit's modern features, including its new architecture; nested, tagged, and dynamic tests; and dependency injection. Summary JUnit is the gold standard for unit testing Java applications. Filled with powerful new features designed to automate software testing, JUnit 5 boosts your productivity and helps avoid debugging nightmares. Whether you're just starting with JUnit or you want to ramp up on the new features, JUnit in Action, Third Edition has you covered. Extensively revised with new code and new chapters, JUnit in Action, Third Edition is an up-to-date guide to smooth software testing. Dozens of hands-on examples illustrate JUnit 5's innovations for dependency injection, nested testing, parameterized tests, and more. Throughout, you'll learn how to use JUnit 5 to automate your testing, for a process that consumes less resources, and gives you more time for developing. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology The JUnit framework is the gold standard for unit testing Java applications—and knowing it is an essential skill for Java developers. The latest version, JUnit 5, is a total overhaul, now supporting modern Java features like Lambdas and Streams. About the book JUnit in Action, Third Edition has been completely rewritten for this release. The book is full of examples that demonstrate JUnit's modern features, including its new architecture; nested, tagged, and dynamic tests; and dependency injection. You'll benefit from author Catalin Tudose's unique "pyramid" testing strategy, which breaks the testing process into layers and sets you on the path to bug-free code creation. What's inside Migrating from JUnit 4 to 5 Effective test automation Test-driven development and behavior-driven development Using mocks for test isolation Connecting JUnit 5 with Maven or Gradle About the reader For intermediate Java developers. About the author Catalin Tudose has a Ph.D. in Computer Science, and over 15 years of experience as a Senior Java Developer and Technical Team Lead. Previous editions were authored by Petar Tahchiev, Felipe Leme, Gary Gregory, and Vincent Massol. Table of Contents PART 1 - JUNIT 1 JUnit jump-start 2 Exploring core JUnit 3 JUnit architecture 4 Migrating from JUnit 4 to JUnit 5 5 Software testing principles PART 2 - DIFFERENT TESTING STRATEGIES 6 Test quality 7 Coarse-grained testing with stubs 8 Testing with mock objects 9 In-container testing PART 3 - WORKING WITH JUNIT 5 AND OTHER TOOLS 10 Running JUnit tests from Maven 3 11 Running JUnit tests from Gradle 6 12 JUnit 5 IDE support 13 Continuous integration with JUnit 5 PART 4 - WORKING WITH MODERN FRAMEWORKS AND JUNIT 5 14 JUnit 5 extension model 15 Presentation-layer testing 16 Testing Spring applications 17 Testing Spring Boot applications 18 Testing a REST API 19 Testing database applications PART 5 - DEVELOPING APPLICATIONS WITH JUNIT 5 20 Test-driven development with JUnit 5 21 Behavior-driven development in JUnit 5 22 Implementing a test pyramid strategy with JUnit 5

Version 5.0 of the Java 2 Standard Edition SDK is the most important upgrade since Java first appeared a decade ago. With Java 5.0, you'll not only find substantial changes in the platform, but to the language itself—something that developers of Java took five years to complete. The main goal of Java 5.0 is to make it easier for you to develop safe, powerful code, but none of these improvements makes Java any easier to learn, even if you've programmed with Java for years. And that means our bestselling hands-on tutorial takes on even greater significance. Learning Java is the most widely sought introduction to the programming language that's changed the way we think about computing. Our up-

dated third edition takes an objective, no-nonsense approach to the new features in Java 5.0, some of which are drastically different from the way things were done in any previous versions. The most essential change is the addition of "generics", a feature that allows developers to write, test, and deploy code once, and then reuse the code again and again for different data types. The beauty of generics is that more problems will be caught during development, and Learning Java will show you exactly how it's done. Java 5.0 also adds more than 1,000 new classes to the Java library. That means 1,000 new things you can do without having to program it in yourself. That's a huge change. With our book's practical examples, you'll come up to speed quickly on this and other new features such as loops and threads. The new edition also includes an introduction to Eclipse, the open source IDE that is growing in popularity. Learning Java, 3rd Edition addresses all of the important uses of Java, such as web applications, servlets, and XML that are increasingly driving enterprise applications.

Maximize the impact of your assets and business services by providing APIs for developers and other users. The journey described in this book starts with identifying business assets. As part of the API team, you then need to identify and define the requirements of traffic management, security, mediation, and orchestration. You also must define metrics for the analytics to measure the success of the overall API program. API documentation and the ease of developer onboarding also determine the success of the APIs. Finally, monetization of these APIs leads to revenue generation for the enterprise. Author De — an expert in building and managing API solutions — provides enterprise architects, designers, and technologists with insight into the world of APIs and the various technical aspects of building and managing an effective API management solution. API Management: Developing and Managing APIs for your Organization: Introduces the basics of APIs and highlights their value Provides an overview of technologies for building an API management solution and defines the requirements, including how to build a RESTful API Offers design principles for building developer-friendly APIs Explains how to secure your APIs Shows how to use API analytics to measure the success of your APIs Demonstrates how to monetize APIs Finally, API Management touches on various technical nuances of creating, distributing, and managing an API. This book will not only help you learn how to design, build, deploy, and manage an API for an enterprise scale, but also generate revenue for your organization. What You'll Learn Discover the API life cycle Design and develop APIs Implement API security Test your APIs Deploy and monitor your APIs Who This Book Is For Enterprise architects, technology enthusiasts, security architects, and operations specialists.

This book is a design handbook and provides skills to successfully design, implement, and optimize business processes on top of SOA. Starting with business process modeling, it shows design principles to architect sound process architectures. It presents best practices for modeling business processes using BPMN, together with design principles for services and composite applications. It provides detailed coverage of how to prepare business processes for execution. An in-depth explanation of human interactions is given and also principles and best practices for using rules. Moving on, Adaptive Case Management principles are explained, along with the reach of business processes to mobile devices and ensuring multichannel interactions. Business activity monitoring, event-driven architectures, complex event processing in relation to business processes, and enabling integration with events and IoT devices are explained. The design principles and best practices are demonstrated in a practical way on a rental car use case.

Have you heard about the tremendous success Amazon and Netflix have had by switching to a microservice architecture? Are

you wondering how this can benefit your company? Or are you skeptical about how it might work? If you've answered yes to any of these questions, this practical book will benefit you. You'll learn how to take advantage of the microservice architectural style for building systems, and learn from the experiences of others to adopt and execute this approach most successfully.

Do you want to know how OpenID Connect works? This book is for you! Exploring how OpenID Connect works in detail is the subject of this book. We take a bottom-up approach and first study all the elements (actors, endpoints, and tokens) of OpenID Connect. This puts us in an excellent position for the second step: to understand the various OpenID Connect Flows - how the actors, endpoints, and tokens are put together to transmit identity claims securely. Do you wonder why there are several OpenID Connect Flows? Whether we use OpenID Connect from a mobile app, a script in a browser or from a secure backend server, there is an appropriate OpenID Connect Flow with the right tradeoffs in security, functionality, and convenience for each of these scenarios. This book helps you to choose the right one. Do you think that these OpenID Connect Flows are confusing? You are not alone; the OpenID Connect Flows tend to get confusing. However, with this book, we make it clear and easy to understand: We visualize these flows and show how to choose the flow that is appropriate for a given scenario. A picture says more than a 1000 words - that is why we explain the OpenID Connect Flows using easy to understand sequence diagrams. Do you want to understand how JWT works? This book explains what a JSON Web Token (JWT) is, how it is used in OpenID Connect, how it is constructed, what data it contains, how to read it, and how to protect its contents. Do you wonder why there are so many tokens in OpenID Connect and how to use them? There are JWT, JWS, JWE, access tokens, refresh tokens, identity tokens, and authorization codes. This book helps you to make sense of them all. Using examples, we explore how the tokens are used, constructed, signed, and encrypted. Why is OpenID Connect so popular? If used in the right way, OpenID Connect is powerful, and everyone loves it: End-users don't need to signup and remember a new password Business owners enjoy high conversion rates Developers don't get any grey hair over securely storing credentials Do you want to increase the conversion rate of your app? Signup and login to a new app become so smooth and convenient that end-users are much more likely to try a new app. It is supported, e.g. by Google, Yahoo, or Microsoft. Would you like to manage no credentials but still have authenticated users? For us developers of web and mobile apps, these signup and login features are attractive, too: we do not need to manage user credentials, and we get a higher conversion rate resulting in more new customers. In effect, this means cutting costs and increasing the number of new customers for our apps. Which programming language do you use in the book? This is not a programming book, don't expect implementations with a specific programming language or library. Instead, we focus on understanding OpenID Connect on a conceptual level, so we can design and architect apps that work with OpenID Connect. And OpenID Connect is the standard behind creating smooth login and signup experiences, increasing the customer signup rate, and creating highly converting apps.

"A comprehensive overview of the challenges teams face when moving to microservices, with industry-tested solutions to these problems." - Tim Moore, Lightbend 44 reusable patterns to develop and deploy reliable production-quality microservices-based applications, with worked examples in Java Key Features 44 design patterns for building and deploying microservices applications Drawing on decades of unique experience from author and microservice architecture pioneer Chris Richardson A pragmatic ap-

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

This book offers an introduction to web-API security with OAuth 2.0 and OpenID Connect. In less than 50 pages you will gain an overview of the capabilities of OAuth. You will learn the core concepts of OAuth. You will get to know all four OAuth flows that are used in cloud solutions and mobile apps. If you have tried to read the official OAuth specification, you may get the impression that OAuth is complex. This book explains OAuth in simple terms. The different OAuth flows are visualized graphically using sequence diagrams. The diagrams allow you to see the big picture of the various OAuth interactions. This high-level overview is complemented with rich set of example requests and responses and an explanation of the technical details. In the book the challenges and benefits of OAuth are presented, followed by an explanation of the technical concepts of OAuth. The technical concepts include the actors, endpoints, tokens and the four OAuth flows. Each flow is described in detail, including the use cases for each flow. Extensions of OAuth are presented, such as OpenID Connect and the SAML2 Bearer Profile. Who should read this book? You do not have the time to read long books? This book provides an overview, the core concepts, without getting lost in the small-small details. This book provides all the necessary information to get started with OAuth in less than 50 pages. You believe OAuth is complicated? OAuth may seem complex with flows and redirects going back and forth. This book will give you clarity by introducing the seemingly complicated material by many illustrations. These illustrations clearly show all the involved interaction parties and the messages they exchange. You want to learn the OAuth concepts efficiently? This book uses many illustrations and sequence diagrams. A good diagram says more than 1000 words. You want to learn the difference between OAuth and OpenID Connect? You wonder when the two concepts are used, what they have in common and what is different between them. This book will help you answer this question. You want to use OAuth in your mobile app? If you want to access resources that are protected by OAuth, you need to get a token first, before you can access the resource. For this, you need to understand the OAuth flows

and the dependencies between the steps of the flows. You want to use OAuth to protect your APIs? OAuth is perfectly suited to protect your APIs. You can learn which OAuth endpoints need to be provided and which checks need to be made within the protected APIs.

Looking for the big picture of building APIs? This book is for you! Building APIs that consumers love should certainly be the goal of any API initiative. However, it is easier said than done. It requires getting the architecture for your APIs right. This book equips you with both foundations and best practices for API architecture. This book is for you if you want to understand the big picture of API design and development, you want to define an API architecture, establish a platform for APIs or simply want to build APIs your consumers love. This book is NOT for you, if you are looking for a step-by-step guide for building APIs, focusing on every detail of the correct application of REST principles. In this case I recommend the book "API Design" of the API-University Series. What is API architecture? Architecture spans the bigger picture of APIs and can be seen from several perspectives: API architecture may refer to the architecture of the complete solution consisting not only of the API itself, but also of an API client such as a mobile app and several other components. API solution architecture explains the components and their relations within the software solution. API architecture may refer to the technical architecture of the API platform. When building, running and exposing not only one, but several APIs, it becomes clear that certain building blocks of the API, runtime functionality and management functionality for the API need to be used over and over again. An API platform provides an infrastructure for developing, running and managing APIs. API architecture may refer to the architecture of the API portfolio. The API portfolio contains all APIs of the enterprise and needs to be managed like a product. API portfolio architecture analyzes the functionality of the API and organizes, manages and reuses the APIs. API architecture may refer to the design decisions for a particular API proxy. To document the design decisions, API description languages are used. We explain the use of API description languages (RAML and Swagger) on many examples. This book covers all of the above perspectives on API architecture. However, to become useful, the architecture needs to be put into practice. This is why this book covers an API methodology for design and development. An API methodology provides practical guidelines for putting API architecture into practice. It explains how to develop an API architecture into an API that consumers love. A lot of the information on APIs is available on the web. Most of it is published by vendors of API products. I am always a bit suspicious of technical information pushed by product vendors. This book is different. In this book, a product-independent view on API architecture is presented. The API-University Series is a modular series of books on API-related topics. Each book focuses on a particular API topic, so you can select the topics within APIs, which are relevant for you.

The basic rules of REST APIs - "many nouns, few verbs, stick with HTTP" - seem easy, but that simplicity and power require discipline to work smoothly. This brief guide provides next steps for implementing complex projects on simple and extensible foundations.

"Every developer working with the Web needs to read this book." -- David Heinemeier Hansson, creator of the Rails framework "RESTful Web Services finally provides a practical roadmap for constructing services that embrace the Web, instead of trying to route around it." -- Adam Trachtenberg, PHP author and eBay Web Services Evangelist You've built web sites that can be used by humans. But can you also build web sites that are usable by machines? That's where the future lies, and that's what RESTful

Web Services shows you how to do. The World Wide Web is the most popular distributed application in history, and Web services and mashups have turned it into a powerful distributed computing platform. But today's web service technologies have lost sight of the simplicity that made the Web successful. They don't work like the Web, and they're missing out on its advantages. This book puts the "Web" back into web services. It shows how you can connect to the programmable web with the technologies you already use every day. The key is REST, the architectural style that drives the Web. This book: Emphasizes the power of basic Web technologies -- the HTTP application protocol, the URI naming standard, and the XML markup language Introduces the Resource-Oriented Architecture (ROA), a common-sense set of rules for designing RESTful web services Shows how a RESTful design is simpler, more versatile, and more scalable than a design based on Remote Procedure Calls (RPC) Includes real-world examples of RESTful web services, like Amazon's Simple Storage Service and the Atom Publishing Protocol Discusses web service clients for popular programming languages Shows how to implement RESTful services in three popular frameworks -- Ruby on Rails, Restlet (for Java), and Django (for Python) Focuses on practical issues: how to design and implement RESTful web services and clients This is the first book that applies the REST design philosophy to real web services. It sets down the best practices you need to make your design a success, and the techniques you need to turn your design into working code. You can harness the power of the Web for programmable applications: you just have to work with the Web instead of against it. This book shows you how.

A lot of work is required to release an API, but the effort doesn't always pay off. Overplanning before an API matures is a wasted investment, while underplanning can lead to disaster. The second edition of this book provides maturity models for individual APIs and multi-API landscapes to help you invest the right human and company resources for the right maturity level at the right time. How do you balance the desire for agility and speed with the need for robust and scalable operations? Four experts show software architects, program directors, and product owners how to maximize the value of their APIs by managing them as products through a continuous lifecycle. Learn which API decisions you need to govern Design, deploy, and manage APIs using an API-as-a-product (AaaS) approach Examine 10 pillars that form the foundation of API product work Learn how the continuous improvement model governs changes throughout an API's lifetime Explore the five stages of a complete API product lifecycle Delve into team roles needed to design, build, and maintain your APIs Learn how to manage APIs published by your organization

Research, strategize, market, and continuously measure the effectiveness of APIs to meet your SaaS business goals with this practical handbook Key Features Transform your APIs into revenue-generating entities by turning them into products Meet your business needs by improving the way you research, strategize, market, and measure results Create and implement a variety of metrics to promote growth Book Description APIs are crucial in the modern market as they allow faster innovation. But have you ever considered your APIs as products for revenue generation? API Analytics for Product Managers takes you through the benefits of efficient researching, strategizing, marketing, and continuously measuring the effectiveness of your APIs to help grow both B2B and B2C SaaS companies. Once you've been introduced to the concept of an API as a product, this fast-paced guide will show you how to establish metrics for activation, retention, engagement, and usage of your API products, as well as metrics to measure the reach and effectiveness of documentation—an often-overlooked aspect of development. Of course, it's not all about the product—as any good product manager knows; you need to un-

derstand your customers' needs, expectations, and satisfaction too. Once you've gathered your data, you'll need to be able to derive actionable insights from it. This is where the book covers the advanced concepts of leading and lagging metrics, removing bias from the metric-setting process, and bringing metrics together to establish long- and short-term goals. By the end of this book, you'll be perfectly placed to apply product management methodologies to the building and scaling of revenue-generating APIs. What you will learn Build a long-term strategy for an API Explore the concepts of the API life cycle and API maturity Understand APIs from a product management perspective Create support models for your APIs that scale with the product Apply user research principles to APIs Explore the metrics of activation, retention, engagement, and churn Cluster metrics together to provide context Examine the consequences of gameable and vanity metrics Who this book is for If you're a product manager, engineer, or product executive charged with making the most of APIs for your SaaS business, then this book is for you. Basic knowledge of how APIs work and what they do is essential before you get started with this book, since the book covers the analytical side of measuring their performance to help your business grow.

Summary Play for Scala shows you how to build Scala-based web applications using the Play 2 framework. This book starts by introducing Play through a comprehensive overview example. Then, you'll look at each facet of a typical Play application both by exploring simple code snippets and by adding to a larger running example. Along the way, you'll deepen your knowledge of Scala as a programming language and work with tools like Akka. About this Book Play is a Scala web framework with built-in advantages: Scala's strong type system helps deliver bug-free code, and the Akka framework helps achieve hassle-free concurrency and peak performance. Play builds on the web's stateless nature for excellent scalability, and because it is event-based and nonblocking, you'll find it to be great for near real-time applications. Play for Scala teaches you to build Scala-based web applications using Play 2. It gets you going with a comprehensive overview example. It then explores each facet of a typical Play application by walking through sample code snippets and adding features to a running example. Along the way, you'll deepen your knowledge of Scala and learn to work with tools like Akka. Written for readers familiar with Scala and web-based application architectures. No knowledge of Play is assumed. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. What's Inside Intro to Play 2 Play's MVC structure Mastering Scala templates and forms Persisting data and using web services Using Play's advanced features About the Authors Peter Hiltonv, Erik Bakker, and Francisco Canedo, are engineers at Lunatech, a consultancy with Scala and Play expertise. They are contributors to the Play framework. Table of Contents PART 1: GETTING STARTED Introduction to Play Your first Play application PART 2: CORE FUNCTIONALITY Deconstructing Play application architecture Defining the application's HTTP interface Storing data—the persistence layer Building a user interface with view templates Validating and processing input with the forms API PART 3: ADVANCED CONCEPTS Building a single-page JavaScript application with JSON Play and more Web services, iterates, and WebSockets

PHP Master is tailor-made for the PHP developer who's serious about taking their server-side applications to the next level and who wants to really keep ahead of the game by adhering to best practice, employing the most effective object-oriented programming techniques, wrapping projects in layers of security and ensuring their code is doing its job perfectly. Create professional, dynamic applications according to an object-oriented programming

blueprint Learn advanced performance evaluation techniques for maximum site efficiency Brush up on the best testing methods to refine your code and keep your applications watertight Protect your site against attacks and vulnerabilities with the latest security systems Plug in to some serious functionality with PHP's APIs and libraries

Summary Microservices in Action is a practical book about building and deploying microservice-based applications. Written for developers and architects with a solid grasp of service-oriented development, it tackles the challenge of putting microservices into production. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Invest your time in designing great applications, 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 components. Master a few important new patterns and processes, and you'll be ready to develop, deploy, and run production-quality microservices. About the Book Microservices in Action teaches you how to write and maintain microservice-based applications. Created with day-to-day development in mind, this informative guide immerses you in real-world use cases from design to deployment. You'll discover how microservices enable an efficient continuous delivery pipeline, and explore examples using Kubernetes, Docker, and Google Container Engine. What's inside An overview of microservice architecture Building a delivery pipeline Best practices for designing multi-service transactions and queries Deploying with containers Monitoring your microservices About the Reader Written for intermediate developers familiar with enterprise architecture and cloud platforms like AWS and GCP. About the Author Morgan Bruce and Paulo A. Pereira are experienced engineering leaders. They work daily with microservices in a production environment, using the techniques detailed in this book. Table of Contents PART 1 - The lay of the land Designing and running microservices Microservices at SimpleBank PART 2 - Design Architecture of a microservice application Designing new features Transactions and queries in microservices Designing reliable services Building a reusable microservice framework PART 3 - Deployment Deploying microservices Deployment with containers and schedulers Building a delivery pipeline for microservices PART 4 - Observability and ownership Building a monitoring system Using logs and traces to understand behavior Building microservice teams

The Definitive Guide to Java Platform, Enterprise Edition 7 Java EE 7: The Big Picture uniquely explores the entire Java EE 7 platform in an all-encompassing style while examining each tier of the platform in enough detail so that you can select the right technologies for specific project needs. In this authoritative guide, Java expert Danny Coward walks you through the code, applications, and frameworks that power the platform. Take full advantage of the robust capabilities of Java EE 7, increase your productivity, and meet enterprise demands with help from this Oracle Press resource. Explore the features of the Java servlet model and Java servlet API Create dynamic web content with JavaServer Pages and JavaServer Faces Build websites for nonbrowser clients with JAX-RS Push data to web clients using Java WebSockets Secure web applications Work with web component APIs Maximize enterprise beans for multithreading, asynchronous processes, transactions, and more Access relational databases with the Java Database Connectivity APIs and the Java Persistence API Understand the packaging and deployment mechanisms of Java EE applications Work with Java EE Contexts and Dependency Injection Secure enterprise beans in a Java EE application Enable parallel processing with Java EE concurrency APIs

Most organizations with a web presence build and operate APIs; the doorway for customers to interact with the company's services. Designing, building, and managing these critical programs affect everyone in the organization, from engineers and product owners to C-suite executives. But the real challenge for developers and solution architects is creating an API platform from the ground up. With this practical book, you'll learn strategies for building and testing REST APIs that use API gateways to combine offerings at the microservice level. Authors James Gough, Daniel Bryant, and Matthew Auburn demonstrate how simple additions to this infrastructure can help engineers and organizations migrate to the cloud; and open the opportunity to connect internal services using technologies like a service mesh. Learn API fundamentals and architectural patterns for building an API platform Use practical examples to understand how to design, build, and test API-based systems Deploy, operate, and configure key components of an API platform Use API gateways and service meshes appropriately, based on case studies Understand core security and common vulnerabilities in API architecture Secure data and APIs using threat modeling and technologies like OAuth2 and TLS Learn how to evolve existing systems toward API- and cloud-based architectures

Software patterns have revolutionized the way developers think about how software is designed, built, and documented, and this unique book offers an in-depth look of what patterns are, what they are not, and how to use them successfully The only book to attempt to develop a comprehensive language that integrates patterns from key literature, it also serves as a reference manual for all pattern-oriented software architecture (POSA) patterns Addresses the question of what a pattern language is and compares various pattern paradigms Developers and programmers operating in an object-oriented environment will find this book to be an invaluable resource

The founder of Architizer.com and practicing architect draws on his unique position at the crossroads of architecture and social media to highlight 100 important buildings that embody the future of architecture. We're asking more of architecture than ever before; the response will define our future. A pavilion made from paper. A building that eats smog. An inflatable concert hall. A research lab that can walk through snow. We're entering a new age in architecture—one where we expect our buildings to deliver far more than just shelter. We want buildings that inspire us while helping the environment; buildings that delight our senses while serving the needs of a community; buildings made possible both by new technology and repurposed materials. Like an architectural cabinet of wonders, this book collects the most innovative buildings of today and tomorrow. The buildings hail from all seven continents (to say nothing of other planets), offering a truly global perspective on what lies ahead. Each page captures the soaring confidence, the thoughtful intelligence, the space-age wonder, and at times the sheer whimsy of the world's most inspired buildings—and the questions they provoke: Can a building breathe? Can a skyscraper be built in a day? Can we 3D-print a house? Can we live on the moon? Filled with gorgeous imagery and witty insight, this book is an essential and delightful guide to the future being built around us—a future that matters more, and to more of us, than ever.

Take a detailed look at the NetBeans IDE and new features in the NetBeans Platform. Learn about support for JShell, the Jigsaw Module System, and Local Variable Type Inference, focusing on what this new version of NetBeans brings to developers who are working in Java and other supported languages. The book is a practical, hands-on guide providing a number of step-by-step recipes that help you take advantage of the power in the latest Java (and other) software platforms, and gives a good grounding on using

NetBeans IDE for your projects. This book has been written by Apache community members who both use the IDE and actively contribute and develop Apache NetBeans as an open source project. Pro Apache NetBeans consists of three parts. The first part describes how to use the IDE as well as the new features that it brings to support the latest Java versions. The second part describes how you can extend NetBeans by creating plugins and writing your own applications using the Rich Client Platform. The third part describes how you can contribute to develop NetBeans IDE further, becoming part of the open source team that is driving future developments in the toolset. What You Will Learn Work faster and more effectively by applying expert tips and tricks Apply NetBeans' most cutting-edge features to your Java development Debug your applications using intuitive features built into the IDE Identify performance issues in your application by using the NetBeans profiler Develop using the latest API of the NetBeans Rich Client Platform Extend Apache NetBeans by creating plugins built on the Rich Client Platform Build NetBeans from source and understand the internals of NetBeans itself Contribute to the large community that supports and develops NetBeans Who This Book Is For Developers who want to know the latest features in NetBeans, as well as how the transition to Apache has affected the future of the NetBeans IDE. The book is also of interest to those desiring to become contributors to the NetBeans project and to influence its future development. Java developers who need to create a new desktop application from scratch also will benefit from this book.

Want to build APIs like Facebook? Since Facebook's framework for building APIs, GraphQL, has become publicly available, this ambition seems to be within reach for many companies. And that is great. But first, let's learn what GraphQL really is and - maybe even more importantly - let's figure out how to apply GraphQL to build APIs that consumers love. Do you like to learn hands-on? In this book, we take a hands-on approach to learning GraphQL. We first explore the concepts of the two GraphQL languages using examples. Then we start writing some code for our first GraphQL API. We develop this API step by step, from creating a schema and resolving queries, over mocking data and connecting data sources all the way to developing mutations and setting up event subscriptions. Are your API consumers important to you? This book shows you how to apply a consumer-oriented design process for GraphQL APIs, so you can deliver what your consumers really want: an API that solves their problems and offers a great developer experience. Do you want to enable the API consumers so they can build great apps? This book explains the GraphQL query language, which allows the API consumers to retrieve data, write data and get notified when data changes. More importantly, you let them decide, which data they really need from the API. Do you want to make your API easy and intuitive to use? This book shows you how to use the GraphQL schema language to define a type system for your API, which serves as a reference documentation and helps your API consumers write queries that are syntactically correct. Do you want to profit from what has worked for others? This book provides a collection of best practices for GraphQL that have worked for other companies, e.g. regarding pagination, authentication and caching. REST vs. GraphQL: Which one is better? GraphQL and REST are competing philosophies for building APIs. It is not in the scope of this book to compare or discuss the two approaches. The focus of this book is on a hands-on approach for learning GraphQL.

Playing with Java Microservices on Kubernetes and OpenShift will teach you how to build and design microservices using Java and the Spring platform. This book covers topics related to creating Java microservices and deploy them to Kubernetes and OpenShift.

Traditionally, Java developers have been used to developing large, complex monolithic applications. The experience of developing and deploying monoliths has been always slow and painful. This book will help Java developers to quickly get started with the features and the concerns of the microservices architecture. It will introduce Docker, Kubernetes and OpenShift to help them deploying their microservices. The book is written for Java developers who wants to build microservices using the Spring Boot/Cloud stack and who wants to deploy them to Kubernetes and OpenShift. You will be guided on how to install the appropriate tools to work properly. For those who are new to Enterprise Development using Spring Boot, you will be introduced to its core principles and main features thru a deep step-by-step tutorial on many components. For experts, this book offers some recipes that illustrate how to split monoliths and implement microservices and deploy them as containers to Kubernetes and OpenShift. The following are some of the key challenges that we will address in this book: - Introducing Spring Boot/Cloud for beginners - Splitting a monolith using the Domain Driven Design approach - Implementing the cloud & microservices patterns - Rethinking the deployment process - Introducing containerization, Docker, Kubernetes and OpenShift By the end of reading this book, you will have practical hands-on experience of building microservices using Spring Boot/Cloud and you will master deploying them as containers to Kubernetes and OpenShift.

Implement application programming interface (API) usability, security, availability, reliability, and scalability to extend your company's market and potentially generate revenue. Businesses know they need to extend their markets into the digital world, and expose internal data to the Internet. This book shows how stakeholders within an organization can make it a successful journey. Stakeholder needs are not identical and departments experience difficulties discussing requirements with each other due to their different fundamental understanding of the process. The goal of this book is to introduce a common language for all business groups—developers, security experts, architects, product managers—around APIs and provide an overview of all aspects that need to be considered when exposing internal data. Most of the content in this book is based on feedback from real-world enterprise customer questions, challenges, and business scenarios. Practical guidance is provided on the business value of APIs, the general requirements to know, and how to undertake an audience-based implementation. You will learn how to protect access to data, as well as API error handling, documentation, management, integration, and more. What You'll Learn Know the types of APIs and their business and technical requirements The main benefits of APIs, including business value, loose coupling, and frequent updates Protect access to APIs through role-based access, attribute-based access, and rate limiting Distinguish between OAuth and OpenID Connect, and know how they both work Manage API error handling, including what should and should not be handled Understand the distinction between runtime, dynamic data, and static data Leverage external APIs as part of your own APIs Who This Book Is For API developers, API security experts, software architects, product owners, and business owners

A step-by-step guide that will help you design, develop, scale, and deploy RESTful APIs with TypeScript 3 and Node.js Key Features Gain in-depth knowledge of OpenAPI and Swagger to build scalable web services Explore a variety of test frameworks and test runners such as Stryker, Mocha, and Chai Create a pipeline by Dockerizing your environment using Travis CI, Google Cloud Platform, and GitHub Book Description In the world of web development, leveraging data is the key to developing comprehensive applications, and RESTful APIs help you to achieve this systematically. This book will guide you in designing and developing web

services with the power of TypeScript 3 and Node.js. You'll design REST APIs using best practices for request handling, validation, authentication, and authorization. You'll also understand how to enhance the capabilities of your APIs with ODMs, databases, models and views, as well as asynchronous callbacks. This book will guide you in securing your environment by testing your services and initiating test automation with different testing approaches. Furthermore, you'll get to grips with developing secure, testable, and more efficient code, and be able to scale and deploy TypeScript 3 and Node.js-powered RESTful APIs on cloud platforms such as the Google Cloud Platform. Finally, the book will help you explore microservices and give you an overview of what GraphQL can allow you to do. By the end of this book, you will be able to use RESTful web services to create your APIs for mobile and web apps and other platforms. What you will learn Explore various methods to plan your services in a scalable way Understand how to handle different request types and the response status code Get to grips with securing web services Delve into error handling and logging your web services for improved debugging Uncover the microservices architecture and GraphQL Create automated CI/CD pipelines for release and deployment strategies Who this book is for If you're a developer who has a basic understanding of REST concepts and want to learn how to design and develop RESTful APIs, this book is for you. Prior knowledge of TypeScript will help you make the most out of this book.

JavaFX is a state-of-the-art graphics toolkit that is now built into Java and can be easily integrated with the NetBeans Platform. With JavaFX, you can create advanced user interfaces, manipulate media, generate graphical effects and animations, and much more. The NetBeans Platform provides a framework for building robust, modular applications with long life expectancies. Together, JavaFX and the NetBeans Platform provide the basis for creating visually appealing, industrial-strength applications. Focusing on JavaFX as the front end for rich client applications, this guide's examples cover JavaFX 8 with the NetBeans Platform, NetBeans IDE, and Java 8. Gail and Paul Anderson fully explain JavaFX and its relationship with the NetBeans Platform architecture, and systematically show Java developers how to use them together effectively. Each concept and technique is supported by clearly written code examples, proven through extensive classroom teaching. Coverage includes Background basics with Java, JavaFX, and UI events Building loosely coupled applications NetBeans Platform Modules and Lookup NetBeans Platform Nodes, Explorer Views, and Actions Building CRUD-based applications Integrating JavaFX with a Swing-based framework Using JavaFX Charts with the NetBeans Platform Using the NetBeans Platform File System and Data System Keeping the UI responsive

This book contains the refereed proceedings of the 12th International Conference on Knowledge Management in Organizations, KMO 2017, held in Beijing, China, in August 2017. The theme of the conference was "Emerging Technology and Knowledge Management in Organizations." The 45 contributions accepted for KMO 2017 were selected from 112 submissions and are organized in topical sections on: Knowledge Management Models and Behaviour Studies; Knowledge Sharing; Knowledge Transfer and Learning; Knowledge and Service Innovation; Knowledge and Organization; Information Systems Research; Value Chain and Supply Chain; Knowledge Re-presentation and Reasoning; Data Mining and Intelligent Science; Big Data Management; Internet of Things and Network.

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 approach them in the right way. This practical guide covers the entire microservices landscape, including the principles, tech-

nologies, and methodologies of this unique, 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 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 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 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 building a microservice architecture. Learn the fundamental design concepts for individual microservices. Delve into the operational elements of a microservices architecture, including containers and service discovery. Discover how to handle the challenges of introducing microservice architecture in your organization.

Looking for Best Practices for RESTful APIs? This book is for you! Why? Because this book is packed with practical experience on what works best for RESTful API Design. You want to design APIs like a Pro? Use API description languages to both design APIs and develop APIs efficiently. The book introduces the two most common API description languages: RAML, OpenAPI, and Swagger. Your company cares about its customers? Learn API product management with a customer-centric design and development approach for APIs. Learn how to manage APIs as a product and how to follow an API-first approach. Build APIs your customers love! You want to manage the complete API lifecycle? An API development methodology is proposed to guide you through the lifecycle: API inception, API design, API development, API publication, API evolution, and maintenance. You want to build APIs right? This book shows best practices for REST design, such as the correct use of resources, URIs, representations, content types, data formats, parameters, HTTP status codes, and HTTP methods. Your APIs connect to legacy systems? The book shows best practices for connecting APIs to existing backend systems. Your APIs connect to a mesh of microservices? The book shows the principles for designing APIs for scalable, autonomous microservices. You expect lots of traffic on your API? The book shows you how to achieve high performance, availability and maintainability. You want to build APIs that last for decades? We study API versioning, API evolution, backward- and forward-compatibility and show API design patterns for versioning. The API-University Series is a modular series of books on API-related topics. Each book focuses on a particular API topic, so you can select the topics within APIs, which are relevant for you.

Build maintainable websites with elegant Django design patterns and modern best practices. Key Features: Explore aspects of Django from Models and Views to testing and deployment. Understand the nuances of web development such as browser attack and data design. Walk through various asynchronous tools such as Celery and Channels. Book Description: Building secure and maintainable web applications requires comprehensive knowledge. The second edition of this book not only sheds light on Django, but also encapsulates years of experience in the form of design patterns and best practices. Rather than sticking to GoF design patterns, the book looks at higher-level patterns. Using the latest version of Django and Python, you'll learn about Channels and asyncio while building a solid conceptual background. The book compares design choices to help you make everyday decisions faster in a rapidly changing environment. You'll first learn about various architectural patterns, many of which are used to build Django. You'll start with building a fun superhero project by gathering the

requirements, creating mockups, and setting up the project. Through project-guided examples, you'll explore the Model, View, templates, workflows, and code reusability techniques. In addition to this, you'll learn practical Python coding techniques in Django that'll enable you to tackle problems related to complex topics such as legacy coding, data modeling, and code reusability. You'll discover API design principles and best practices, and understand the need for asynchronous workflows. During this journey, you'll study popular Python code testing techniques in Django, various web security threats and their countermeasures, and the monitoring and performance of your application. What you will learn: Make use of common design patterns to help you write better code. Implement best practices and idioms in this rapidly evolving framework. Deal with legacy code and debugging. Use asynchronous tools such as Celery, Channels, and asyncio. Use patterns while designing API interfaces with the Django REST Framework. Reduce the maintenance burden with well-tested, cleaner code. Host, deploy, and secure your Django projects. Who this book is for: This book is for you whether you're new to Django or just want to learn its best practices. You do not have to be an expert in Django or Python. No prior knowledge of patterns is expected for reading this book but it would be helpful.

Find the right big data solution for your business or organization. Big data management is one of the major challenges facing business, industry, and not-for-profit organizations. Data sets such as customer transactions for a mega-retailer, weather patterns monitored by meteorologists, or social network activity can quickly outpace the capacity of traditional data management tools. If you need to develop or manage big data solutions, you'll appreciate how these four experts define, explain, and guide you through this new and often confusing concept. You'll learn what it is, why it matters, and how to choose and implement solutions that work. Effectively managing big data is an issue of growing importance to businesses, not-for-profit organizations, government, and IT professionals. Authors are experts in information management, big data, and a variety of solutions. Explains big data in detail and discusses how to select and implement a solution, security concerns to consider, data storage and presentation issues, analytics, and much more. Provides essential information in a no-nonsense, easy-to-understand style that is empowering. Big Data For Dummies cuts through the confusion and helps you take charge of big data solutions for your organization.

The Full-Lifecycle Guide to API Design Principles of Web API Design brings together principles and processes to help you succeed across the entire API design lifecycle. Drawing on extensive in-the-trenches experience, leading consultant James Higginbotham helps you align every stakeholder on specific outcomes, design APIs that deliver value, and scale the design process from small teams to the entire organization. Higginbotham helps you bring an "outside-in" perspective to API design to reflect the voices of customers and product teams, map requirements to specific and well-organized APIs, and choose the right API style for writing them. He walks through a real-world example from the ground up, offering guidance for anyone designing new APIs or extending existing APIs. Deliver great APIs by getting your design processes right. Gain agreement on specific outcomes from design teams, customers, and other stakeholders. Craft job stories, conduct EventStorming, and model capabilities. Identify the right APIs, and organize operations into coherent API profiles. Choose the best styles for each project: REST, gRPC, GraphQL, or event-based async APIs. Refine designs based on feedback from documenters, testers, and customers. Decompose APIs into microservices. Mature your API program, implementing design and management processes that scale. This guide is invaluable for anyone involved in planning or building APIs--architects, developers, team leaders,

managers in single and multi-team environments, and any technical or business professional delivering "API-as-a-product" offerings. Register your book for convenient access to downloads, updates, and/or corrections as they become available. See inside book for details.

A lot of work is required to release an API, but the effort doesn't always pay off. Overplanning before an API matures is a wasted investment, while underplanning can lead to disaster. This practical guide provides maturity models for individual APIs and multi-API landscapes to help you invest the right human and company resources for the right maturity level at the right time. How do you balance the desire for agility and speed with the need for robust and scalable operations? Four experts from the API Academy show software architects, program directors, and product owners how to maximize the value of their APIs by managing them as products through a continuous life cycle. Learn which API decisions you need to govern and how and where to do so Design, deploy, and manage APIs using an API-as-a-product (AaaP) approach Examine ten pillars that form the foundation of API product work Learn how the continuous improvement model governs changes throughout an API's lifetime Explore the five stages of a complete API product life cycle Delve into team roles needed to design, build, and maintain your APIs Learn how to manage your API landscape—the set of APIs published by your organization

This book provides a very common-sense approach to transforming the Electricity Industry to meet clean energy goals and simplifying coordination with DER at scale with plug and play interoperability over time. It shows you a new way to architect solutions using a modern, event-driven, standards-based, elastic, cloud-based, distributed architecture to simplify and abstract communications with utility, customer, and third-party owned clean energy assets. The book describes the architectural and technological problems of our 20th Century centralized model and provides a pragmatic alternative architecture with examples of how to seamlessly integrate large numbers of Distributed Energy Resources (DER) with centralized systems that take advantage of intelligent edge devices through coordination instead of direct command and control. It also includes references to DOE's Laminar Grid Architecture philosophy and shows how the Energy IoT Reference Architecture is aligned to solve today's biggest Electricity Industry problems. You'll find detailed explanations of common energy IoT reference architecture; understand integration of utility, customer, and third party distributed grid assets to support grid services and market opportunities, and master the elastic scalability solution which is considered by many to be the biggest problem in utility systems for DER. This is a must-have resource for architects, engineers, software developers, government officials, undergraduate students, and professors.

Innovate at scale through well-architected API-led products that drive personalized, predictive, and adaptive customer experiences Key Features Strategize your IT investments by modeling enterprise solutions with an API-centric approach Build robust and reliable API platforms to boost business agility and omnichannel delivery Create digital value chains through the productization of your APIs Book Description API-centric architectures are foundational to delivering omnichannel experiences for an enterprise. With this book, developers will learn techniques to design loosely coupled, cloud-based, business-tier interfaces that can be consumed by a variety of client applications. Using real-world examples and case studies, the book helps you get to grips with the cloudbased design and implementation of reliable and resilient API-centric solutions. Starting with the evolution of enterprise applications, you'll learn how API-based integration architectures drive digital transformation. You'll then learn about the important principles

and practices that apply to cloud-based API architectures and advance to exploring the different architecture styles and their implementation in Azure. This book is written from a practitioner's point of view, so you'll discover ideas and practices that have worked successfully in various customer scenarios. By the end of this book, you'll be able to architect, design, deploy, and monetize your API solutions in the Azure cloud while implementing best practices and industry standards. What you will learn Explore the benefits of API-led architecture in an enterprise Build highly reliable and resilient, cloud-based, API-centric solutions Plan technical initiatives based on Well-Architected Framework principles Get to grips with the productization and management of your API assets for value creation Design high-scale enterprise integration platforms on the Azure cloud Study the important principles and practices that apply to cloud-based API architectures Who this book is for This book is for solution architects, developers, engineers, DevOps professionals, and IT decision-makers who are responsible for designing and developing large distributed systems. Familiarity with enterprise solution architectures and cloud-based design will help you to comprehend the concepts covered in the book easily.

Make the best of your test suites by using cutting-edge software architecture patterns in Python Key Features Learn how to create scalable and maintainable applications Build a web system for micro messaging using concepts in the book Use profiling to find bottlenecks and improve the speed of the system Book Description Developing large-scale systems that continuously grow in scale and complexity requires a thorough understanding of how software projects should be implemented. Software developers, architects, and technical management teams rely on high-level software design patterns such as microservices architecture, event-driven architecture, and the strategic patterns prescribed by domain-driven design (DDD) to make their work easier. This book covers these proven architecture design patterns with a forward-looking approach to help Python developers manage application complexity—and get the most value out of their test suites. Starting with the initial stages of design, you will learn about the main blocks and mental flow to use at the start of a project. The book covers various architectural patterns like microservices, web services, and event-driven structures and how to choose the one best suited to your project. Establishing a foundation of required concepts, you will progress into development, debugging, and testing to produce high-quality code that is ready for deployment. You will learn about ongoing operations on how to continue the task after the system is deployed to end users, as the software development lifecycle is never finished. By the end of this Python book, you will have developed "architectural thinking": a different way of approaching software design, including making changes to ongoing systems. What you will learn Think like an architect, analyzing software architecture patterns Explore API design, data storage, and data representation methods Investigate the nuances of common architectural structures Utilize and interoperate elements of patterns such as microservices Implement test-driven development to perform quality code testing Recognize chunks of code that can be restructured as packages Maintain backward compatibility and deploy iterative changes Who this book is for This book will help software developers and architects understand the structure of large complex systems and adopt architectural patterns that are scalable. Examples in the book are implemented in Python so a fair grasp of basic Python concepts is expected. Proficiency in any programming languages such as Java or JavaScript is sufficient.

Got RESTful APIs? Great. API consumers love them. But today, such RESTful APIs are not enough for the evolving expectations of API consumers. Their apps need to be responsive, event-based

and react to changes in near real-time. This results in a new set of requirements for the APIs, which power the apps. APIs now need to provide concepts such as events, notifications, triggers, and subscriptions. These concepts are not natively supported by the REST architectural style. In this book we show how to engineer RESTful APIs that support events with a webhook infrastructure. What are the alternatives to webhooks? We study several approaches for realizing events, such as Polling, Long Polling, Webhooks, HTTP Streaming, Server-Sent Events, WebSockets, WebSub and GraphQL Subscriptions. All of these approaches

have their advantages and disadvantages. Can webhooks communicate in real-time? We study the non-functional requirements of a webhooks infrastructure, in areas such as security, reliability and developer experience. How do well-known API providers design webhooks? We examine the webhook infrastructure provided by GitHub, BitBucket, Stripe, Slack, and Intercom. With the best practices, case studies, and design templates provided in this book, we want to help you extend your API portfolio with a modern webhook infrastructure. So you can offer both APIs and events that developers love to use.