

Cqrs The Example

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

As Python continues to grow in popularity, projects are becoming larger and more complex. Many Python developers are now taking an interest in high-level software design patterns such as hexagonal/clean architecture, event-driven architecture, and the strategic patterns prescribed by domain-driven design (DDD). But translating those patterns into Python isn't always straightforward. With this hands-on guide, Harry Percival and Bob Gregory from MADE.com introduce proven architectural design patterns to help Python developers manage application complexity—and get the most value out of their test suites. Each pattern is illustrated with concrete examples in beautiful, idiomatic Python, avoiding some of the verbosity of Java and C# syntax. Patterns include:

- Dependency inversion and its links to ports and adapters (hexagonal/clean architecture)
- Domain-driven design's distinction between entities, value objects, and aggregates
- Repository and Unit of Work patterns for persistent storage

Events, commands, and the message bus Command-query responsibility segregation (CQRS) Event-driven architecture and reactive microservices A software architect's digest of core practices, pragmatically applied Designing effective architecture is your best strategy for managing project complexity—and improving your results. But the principles and practices of software architecting—what the authors call the “science of hard decisions”—have been evolving for cloud, mobile, and other shifts. Now fully revised and updated, this book shares the knowledge and real-world perspectives that enable you to design for success—and deliver more successful solutions. In this fully updated Second Edition, you will: Learn how only a deep understanding of domain can lead to appropriate architecture Examine domain-driven design in both theory and implementation Shift your approach to code first, model later—including multilayer architecture Capture the benefits of prioritizing software maintainability See how readability, testability, and extensibility lead to code quality Take a user experience (UX) first approach, rather than designing for data Review patterns for organizing business logic Use event sourcing and CQRS together to model complex business domains more effectively Delve inside the persistence layer, including patterns and implementation.

In 2009 I have had the pleasure of spending a 2 day course and many geek beers with Greg Young talking about Domain-Driven Design specifically focussed on Command Query Responsibility Segregation (CQRS). The example project I created based on these discussions was very well received by the community and regarded a good reference project to explain and learn the patterns that make up CQRS. I decided to add the different blog posts I wrote about the example into a single book so it is easy to find and read. The code can still be found at: <http://github.com/MarkNijhof/Fohjin>

The standard platform for enterprise application development has been EJB but the difficulties of working with it caused it to become unpopular. They also gave rise to lightweight technologies such as Hibernate, Spring, JDO, iBATIS and others, all of which allow the developer to work directly with the simpler POJOs. Now EJB version 3 solves the problems that gave EJB 2 a black eye—it too works with POJOs. POJOs in Action describes the new, easier ways to develop enterprise Java applications. It describes how to make key design decisions when developing business logic using POJOs, including how to organize and encapsulate the business logic, access the database, manage transactions, and handle database concurrency. This book is a new-generation Java applications guide: it enables readers to successfully build lightweight applications that are easier to develop, test, and maintain.

Pro ASP.NET Web API shows you how to build flexible, extensible web services that run seamlessly on a range of operating systems and devices, from desktops to tablets to smart phones—even the ones we don't know today. ASP.NET Web API is a new framework designed to simplify web service architecture. So if you're tired of interoperability issues between inflexible web services and clients

tied to specific platforms or programming languages, or if you've ever struggled with WCF, this book is for you. To start with, you'll get up to speed on Web API's modern HTTP programming model, REST and your hosting options. You'll then dive into building a real application over a series of three chapters, so you can get an immediate feel for how this technology works in practice. The second half of the book features dedicated chapters on topics like routing, controllers, validation and tracing, and the authors close with discussions on performance, hosting and an all-important look at unit testing to help you prepare your application for the real world. ASP.NET Web API makes HTTP a first-class citizen of .NET. With Pro ASP.NET Web API, you can build HTTP-based web services for your company or business, expose your data to the world across different formats and devices and gain the best possible global reach for your application.

Domain-Driven Design (DDD) software modeling delivers powerful results in practice, not just in theory, which is why developers worldwide are rapidly moving to adopt it. Now, for the first time, there's an accessible guide to the basics of DDD: What it is, what problems it solves, how it works, and how to quickly gain value from it. Concise, readable, and actionable, Domain-Driven Design Distilled never buries you in detail—it focuses on what you need to know to get results. Vaughn Vernon, author of the best-selling *Implementing Domain-Driven Design*, draws on his twenty years of experience applying DDD principles to real-world situations. He is uniquely well-qualified to demystify its complexities, illuminate its subtleties, and help you solve the problems you might encounter. Vernon guides you through each core DDD technique for building better software. You'll learn how to segregate domain models using the powerful Bounded Contexts pattern, to develop a Ubiquitous Language within an explicitly bounded context, and to help domain experts and developers work together to create that language. Vernon shows how to use Subdomains to handle legacy systems and to integrate multiple Bounded Contexts to define both team relationships and technical mechanisms. Domain-Driven Design Distilled brings DDD to life. Whether you're a developer, architect, analyst, consultant, or customer, Vernon helps you truly understand it so you can benefit from its remarkable power. Coverage includes What DDD can do for you and your organization—and why it's so important The cornerstones of strategic design with DDD: Bounded Contexts and Ubiquitous Language Strategic design with Subdomains Context Mapping: helping teams work together and integrate software more strategically Tactical design with Aggregates and Domain Events Using project acceleration and management tools to establish and maintain team cadence

This guide is focused on building highly scalable, highly available, and maintainable applications with the Command & Query Responsibility Segregation and the Event Sourcing architectural patterns. It presents a learning journey, not definitive guidance. It describes the experiences of a development team with no prior CQRS proficiency in building, deploying (to Windows Azure), and

maintaining a sample real-world, complex, enterprise system to showcase various CQRS and ES concepts, challenges, and techniques. The development team did not work in isolation; we actively sought input from industry experts and from a wide group of advisors to ensure that the guidance is both detailed and practical. The CQRS pattern and event sourcing are not mere simplistic solutions to the problems associated with large-scale, distributed systems. By providing you with both a working application and written guidance, we expect you'll be well prepared to embark on your own CQRS journey.

Explore the concepts and tools you need to discover the world 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 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 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 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* 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 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 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 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 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 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, 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 like implement microservice design patterns in their enterprise application development. The book assumes some prior programming knowledge.

Methods for managing complex software construction following the practices, principles and patterns of Domain-Driven Design with code examples in C# This book presents the philosophy of Domain-Driven Design (DDD) in a down-to-earth and practical manner for experienced developers building applications for complex domains. A focus is placed on the principles and practices of decomposing a complex problem space as well as the implementation patterns and best practices for shaping a maintainable solution space. You will learn how to build effective domain models through the use of tactical patterns and how to retain their integrity by applying the strategic patterns of DDD. Full end-to-end coding examples demonstrate techniques for integrating a decomposed and distributed solution space while coding best practices and patterns advise you on how to architect applications for maintenance and scale. Offers a thorough introduction to the philosophy of DDD for professional developers Includes masses of code and examples of concept in action that other books have only covered theoretically Covers the patterns of CQRS, Messaging, REST, Event Sourcing and Event-Driven Architectures Also ideal for Java developers who want to better

understand the implementation of DDD

Practical Software Architecture Solutions from the Legendary Robert C. Martin (“Uncle Bob”) By applying universal rules of software architecture, you can dramatically improve developer productivity throughout the life of any software system. Now, building upon the success of his best-selling books Clean Code and The Clean Coder, legendary software craftsman Robert C. Martin (“Uncle Bob”) reveals those rules and helps you apply them. Martin’s Clean Architecture doesn’t merely present options. Drawing on over a half-century of experience in software environments of every imaginable type, Martin tells you what choices to make and why they are critical to your success. As you’ve come to expect from Uncle Bob, this book is packed with direct, no-nonsense solutions for the real challenges you’ll face—the ones that will make or break your projects. Learn what software architects need to achieve—and core disciplines and practices for achieving it Master essential software design principles for addressing function, component separation, and data management See how programming paradigms impose discipline by restricting what developers can do Understand what’s critically important and what’s merely a “detail” Implement optimal, high-level structures for web, database, thick-client, console, and embedded applications Define appropriate boundaries and layers, and organize components and services See why designs and architectures go wrong, and how to prevent (or fix) these failures Clean Architecture is essential reading for every current or aspiring software architect, systems analyst, system designer, and software manager—and for every programmer who must execute someone else’s designs. Register your product for convenient access to downloads, updates, and/or corrections as they become available.

Cloud applications have a unique set of characteristics. They run on commodity hardware, provide services to untrusted users, and deal with unpredictable workloads. These factors impose a range of problems that you, as a designer or developer, need to resolve. Your applications must be resilient so that they can recover from failures, secure to protect services from malicious attacks, and elastic in order to respond to an ever changing workload. This guide demonstrates design patterns that can help you to solve the problems you might encounter in many different areas of cloud application development. Each pattern discusses design considerations, and explains how you can implement it using the features of Windows Azure. The patterns are grouped into categories: availability, data management, design and implementation, messaging, performance and scalability, resilience, management and monitoring, and security. You will also see more general guidance related to these areas of concern. It explains key concepts such as data consistency and asynchronous messaging. In addition, there is useful guidance and explanation of the key considerations for designing features such as data partitioning, telemetry, and hosting in multiple datacenters. These patterns and guidance can help you to improve the quality of applications and services you create, and make the development process more efficient. Enjoy!

Enterprise Patterns and MDA teaches you how to customize any archetype pattern—such as Customer, Product, and Order—to reflect the idiosyncrasies of your own business environment. Because all the patterns work harmoniously together and have clearly documented relationships to each other, you’ll come away with a host of reusable solutions to common problems in business-software design. This book shows you how using a pattern or a fragment of a pattern can save you months of work and help you avoid costly errors. You’ll also discover how—when used in literate modeling—patterns can solve the difficult challenge of communicating UML models to broad audiences. The configurable patterns can be used manually to create executable code. However, the authors draw on their extensive experience to show you how to tap the significant power of MDA and UML for maximum automation. Not surprisingly, the patterns included in this book are highly valuable; a blue-chip company recently valued a similar, but less mature, set of patterns at hundreds of thousands of dollars.

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Use this practical guide to increase the efficiency of your designs and to create robust business applications that can be applied immediately in a business setting.

Entity Framework Core in Action, Second Edition teaches you to write flawless database interactions for .NET applications. Summary Entity Framework Core in Action, Second Edition is an in-depth guide to reading and writing databases with EF Core. Revised from the bestselling original edition, it's filled with over 100 diagrams, code snippets, and examples—including building and scaling your own bookselling web application. Learn from author Jon Smith's extensive experience working with EF Core in production, as you discover time-saving patterns and best practices for security, performance tuning, and unit testing. All of the book's code is available on GitHub. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology Entity Framework radically simplifies data access in .NET applications. This easy-to-use object-relational mapper (ORM) lets you write database code in pure C#. It automatically maps classes to database tables and enables queries with standard LINQ commands. It even generates SQL, so you don't have to! About the book Entity Framework Core in Action, Second Edition teaches you to write flawless database interactions for .NET applications. Following relevant examples from author Jon Smith's extensive experience, you'll progress quickly from EF basics to advanced techniques. In addition to the latest EF features, this book addresses performance, security, refactoring, and unit testing. This updated edition also contains new material on NoSQL databases. What's inside Configure EF to define every table and column Update your schema as your app grows Integrating EF with existing C# application Write and test business logic for database access Applying a Domain-Driven Design to EF Core Getting the best performance out of EF Core About the reader For .NET developers familiar with relational databases. About the author Jon P. Smith is a freelance software developer and architect with a special focus on .NET and Azure. Table of Contents PART 1 1 Introduction to Entity Framework Core 2 Querying the database 3 Changing the database content 4 Using EF Core in business logic 5 Using EF Core in ASP.NET Core web applications 6 Tips and techniques for reading and writing with EF Core PART 2 7 Configuring nonrelational properties 8 Configuring relationships 9 Handling database migrations 10 Configuring advanced features and handling concurrency conflicts 11 Going deeper into the DbContext PART 3 12 Using entity events to solve business problems 13 Domain-Driven Design and other architectural approaches 14 EF Core performance tuning 15 Master class on performance-tuning database queries 16 Cosmos DB, CQRS, and other database types 17 Unit testing EF Core applications

Domain Driven Design is a vision and approach for dealing with highly complex domains that is based on making the domain itself the main focus of the project, and maintaining a software model that reflects a deep understanding of the domain. This book is a short, quickly-readable summary and introduction to the fundamentals of DDD; it does not introduce any new concepts; it attempts to concisely summarize the essence of what DDD is, drawing mostly Eric Evans' original book, as well other sources since published such as Jimmy Nilsson's Applying Domain Driven Design, and various DDD discussion forums. The main topics covered in the book include: Building Domain Knowledge, The Ubiquitous Language, Model Driven Design, Refactoring Toward Deeper Insight, and Preserving Model Integrity. Also included is an interview with Eric Evans on Domain Driven Design today.

Domain-Driven Design in PHPPackt Publishing Ltd

"After many decades - and even more methodologies - software projects are still failing. Why? Managers see software development as a production line. Companies don't know how to manage software projects and hire good developers. Many developers still behave like factory workers, providing terrible service to their employers and clients. Agile was a big step forward, but not enough. What's missing? The right mindset - for both developers and their employers.

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As developers worldwide are recognizing, the right mindset is craftsmanship ... Mancuso explains what craftsmanship means to the developer and his or her organization, and shows how to live it every day in your real-world development environment. Mancuso shows how software craftsmanship fits with and helps you improve upon best-practice technical disciplines such as agile and lean, taking all your development projects to the next level. You'll learn how to change the disastrous perception that software developers are the same as factory workers, and that software projects can be run like factories. By placing greater professionalism, technical excellence, and customer satisfaction at the heart of what you do, you won't just deliver more value to everyone involved: you'll be happier and more fulfilled doing it"--Publisher's description.

Solve complex business problems by understanding users better, finding the right problem to solve, and building lean event-driven systems to give your customers what they really want

Key Features

- Apply DDD principles using modern tools such as EventStorming, Event Sourcing, and CQRS
- Learn how DDD applies directly to various architectural styles such as REST, reactive systems, and microservices
- Empower teams to work flexibly with improved services and decoupled interactions

Book Description

Developers across the world are rapidly adopting DDD principles to deliver powerful results when writing software that deals with complex business requirements. This book will guide you in involving business stakeholders when choosing the software you are planning to build for them. By figuring out the temporal nature of behavior-driven domain models, you will be able to build leaner, more agile, and modular systems. You'll begin by uncovering domain complexity and learn how to capture the behavioral aspects of the domain language. You will then learn about EventStorming and advance to creating a new project in .NET Core 2.1; you'll also and write some code to transfer your events from sticky notes to C#. The book will show you how to use aggregates to handle commands and produce events. As you progress, you'll get to grips with Bounded Contexts, Context Map, Event Sourcing, and CQRS. After translating domain models into executable C# code, you will create a frontend for your application using Vue.js. In addition to this, you'll learn how to refactor your code and cover event versioning and migration essentials. By the end of this DDD book, you will have gained the confidence to implement the DDD approach in your organization and be able to explore new techniques that complement what you've learned from the book.

What you will learn

- Discover and resolve domain complexity together with business stakeholders
- Avoid common pitfalls when creating the domain model
- Study the concept of Bounded Context and aggregate
- Design and build temporal models based on behavior and not only data
- Explore benefits and drawbacks of Event Sourcing
- Get acquainted with CQRS and to-the-point read models with projections
- Practice building one-way flow UI with Vue.js
- Understand how a task-based UI conforms to DDD principles

Who this book is for

This book is for .NET developers who have an intermediate level understanding of C#, and for those who seek to deliver value, not just write code. Intermediate level of competence in JavaScript will be helpful to follow the UI chapters. At a time when nearly every vertical, regardless 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-on guide shows you how to create, test, compile, and deploy microservices, using the ASP.NET Core free and open-source framework. Along the way, you'll pick up good, practical habits for building powerful and robust services. Building microservices isn't about learning a specific framework or programming language; 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 practical book guides you through the process. Learn test-driven and API-first development concepts

- Communicate with other services by creating and consuming backing services such as databases and queues
- Build a microservice that depends on an external data source
- Learn about event sourcing, the event-

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centric approach to persistence Use ASP.NET Core to build web applications designed to thrive in the cloud Build a service that consumes, or is consumed by, other services Create services and applications that accept external configuration Explore ways to secure ASP.NET Core microservices and applications

A single dramatic software failure can cost a company millions of dollars - but can be avoided with simple changes to design and architecture. This new edition of the best-selling industry standard shows you how to create systems that run longer, with fewer failures, and recover better when bad things happen. New coverage includes DevOps, microservices, and cloud-native architecture. Stability antipatterns have grown to include systemic problems in large-scale systems. This is a must-have pragmatic guide to engineering for production systems. If you're a software developer, and you don't want to get alerts every night for the rest of your life, help is here. With a combination of case studies about huge losses - lost revenue, lost reputation, lost time, lost opportunity - and practical, down-to-earth advice that was all gained through painful experience, this book helps you avoid the pitfalls that cost companies millions of dollars in downtime and reputation. Eighty percent of project life-cycle cost is in production, yet few books address this topic. This updated edition deals with the production of today's systems - larger, more complex, and heavily virtualized - and includes information on chaos engineering, the discipline of applying randomness and deliberate stress to reveal systematic problems. Build systems that survive the real world, avoid downtime, implement zero-downtime upgrades and continuous delivery, and make cloud-native applications resilient. Examine ways to architect, design, and build software - particularly distributed systems - that stands up to the typhoon winds of a flash mob, a Slashdotting, or a link on Reddit. Take a hard look at software that failed the test and find ways to make sure your software survives. To skip the pain and get the experience...get this book.

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

In this new book, leading practitioner Greg Young shows how to incorporate effective domain modeling throughout the software development process, designing large and complex systems

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so they can be built more efficiently, dynamically, and successfully. Young takes the next steps beyond the DDD principles and best practices introduced by Eric Evans in *Domain-Driven Design: Tackling Complexity in the Heart of Software*. One step at a time, he explains how to use DDD with Command-Query Responsibility Separation (CQRS) to select the right design solutions and make them work in the real world. System designers and architects will learn how CQRS and event sourcing can simplify construction, decentralize decision-making, and make system development more flexible and responsive. Young also shows how DDD and CQRS make it possible to coordinate larger development teams without higher levels of management maturity. To write this book, Young has drawn on his widely-praised 3-day course on CQRS, Domain Events, Event Sourcing, and DDD. He answers many of the questions course participants have raised, shows how to overcome common architectural obstacles to DDD, and guides professionals in solving the #1 problem they've encountered: translating DDD's abstract concepts into concrete solutions.

Summary Cloud Native Patterns is your guide to developing strong applications that thrive in the dynamic, distributed, virtual world of the cloud. This book presents a mental model for cloud-native applications, along with the patterns, practices, and tooling that set them apart. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Cloud platforms promise the holy grail: near-zero downtime, infinite scalability, short feedback cycles, fault-tolerance, and cost control. But how do you get there? By applying cloud-native designs, developers can build resilient, easily adaptable, web-scale distributed applications that handle massive user traffic and data loads. Learn these fundamental patterns and practices, and you'll be ready to thrive in the dynamic, distributed, virtual world of the cloud. About the Book With 25 years of experience under her belt, Cornelia Davis teaches you the practices and patterns that set cloud-native applications apart. With realistic examples and expert advice for working with apps, data, services, routing, and more, she shows you how to design and build software that functions beautifully on modern cloud platforms. As you read, you will start to appreciate that cloud-native computing is more about the how and why rather than the where. What's inside The lifecycle of cloud-native apps Cloud-scale configuration management Zero downtime upgrades, versioned services, and parallel deploys Service discovery and dynamic routing Managing interactions between services, including retries and circuit breakers About the Reader Requires basic software design skills and an ability to read Java or a similar language. About the Author Cornelia Davis is Vice President of Technology at Pivotal Software. A teacher at heart, she's spent the last 25 years making good software and great software developers. Table of Contents PART 1 - THE CLOUD-NATIVE CONTEXT You keep using that word: Defining "cloud-native" Running cloud-native applications in production The platform for cloud-native software PART 2 - CLOUD-NATIVE PATTERNS Event-driven microservices: It's not just request/response App redundancy: Scale-out and statelessness Application configuration: Not just environment variables The application lifecycle: Accounting for constant change Accessing apps: Services, routing, and service discovery Interaction redundancy: Retries and other control loops Fronting services: Circuit breakers and API gateways Troubleshooting: Finding the needle in the haystack Cloud-native data: Breaking the data monolith

There are a lot of misconceptions around the CQRS pattern, especially when it comes to applying it in real-world software projects. In this book, CQRS, you will learn all about CQRS with event sourcing, database configuration for reads and writes, and more. First, you will learn exactly what CQRS is, the principles behind it, and the benefits it can provide for your project. Next, you will explore the common misconceptions and anti-patterns around CQRS. Finally, you will see a detailed, step-by-step implementation of this pattern in practice. The sample project you'll be working on is close to what you will find in the real world, and you will see each step on the way to CQRS in great detail. By the end of this book, you will have a foundational

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understanding of the CQRS pattern and how to implement it in your software projects. See how Domain-Driven Design (DDD) combines with Jakarta EE MicroProfile or Spring Boot to offer a complete suite for building enterprise-grade applications. In this book you will see how these all come together in one of the most efficient ways to develop complex software. Practical Domain-Driven Design in Enterprise Java starts by building out the Cargo Tracker reference application as a monolithic application using the Jakarta EE platform. By doing so, you will map concepts of DDD (bounded contexts, language, and aggregates) to the corresponding available tools (CDI, JAX-RS, and JPA) within the Jakarta EE platform. Once you have completed the monolithic application, you will walk through the complete conversion of the monolith to a microservices-based architecture, again mapping the concepts of DDD and the corresponding available tools within the MicroProfile platform (config, discovery, and fault tolerance). To finish this section, you will examine the same microservices architecture on the Spring Boot platform. The final set of chapters looks at what the application would be like if you used the CQRS and event sourcing patterns. Here you'll use the Axon framework as the base framework. What You Will Learn Discover the DDD architectural principles and use the DDD design patterns Use the new Eclipse Jakarta EE platform Work with the Spring Boot framework Implement microservices design patterns, including context mapping, logic design, entities, integration, testing, and security Carry out event sourcing Apply CQRS Who This Book Is For Junior developers intending to start working on enterprise Java; senior developers transitioning from monolithic- to microservices-based architectures; and architects transitioning to a DDD philosophy of building applications.

Hands-On Design Patterns with C# and .NET Core covers all the essential design patterns that help .NET developers build effective applications. The book will add to your skills by showing you how these patterns can be implemented easily in everyday programming, enabling you to develop robust applications with optimal performance.

Cloud reliability engineering is a leading issue of cloud services. Cloud service providers guarantee computation, storage and applications through service-level agreements (SLAs) for promised levels of performance and uptime. Cloud Reliability Engineering: Technologies and Tools presents case studies examining cloud services, their challenges, and the reliability mechanisms used by cloud service providers. These case studies provide readers with techniques to harness cloud reliability and availability requirements in their own endeavors. Both conceptual and applied, the book explains reliability theory and the best practices used by cloud service companies to provide high availability. It also examines load balancing, and cloud security. Written by researchers and practitioners, the book's chapters are a comprehensive study of cloud reliability and availability issues and solutions. Various reliability class distributions and their effects on cloud reliability are discussed. An important aspect of reliability block diagrams is used to categorize poor reliability of cloud infrastructures, where enhancement can be made to lower the failure rate of the system. This technique can be used in design and functional stages to determine poor reliability of a system and provide target improvements. Load balancing for reliability is examined as a migrating process or performed by using virtual machines. The approach employed to identify the lightly loaded destination node to which the processes/virtual machines migrate can be optimized by employing a genetic algorithm. To analyze security risk and reliability, a novel technique for minimizing the number of keys and the security system is presented. The book also provides an overview of testing methods for the cloud, and a case study discusses testing reliability, installability, and security. A comprehensive volume, Cloud Reliability Engineering: Technologies and Tools combines research, theory, and best practices used to engineer reliable cloud availability and performance.

A professional's guide to solving complex problems while designing modern software Key Features Learn best practices for designing enterprise-grade software systems Understand the

importance of building reliable, maintainable, and scalable systems Become a professional software architect by learning the most effective software design patterns and architectural concepts Book Description As businesses are undergoing a digital transformation to keep up with competition, it is now more important than ever for IT professionals to design systems to keep up with the rate of change while maintaining stability. This book takes you through the architectural patterns that power enterprise-grade software systems and the key architectural elements that enable change such as events, autonomous services, and micro frontends, along with demonstrating how to implement and operate anti-fragile systems. You'll divide up a system and define boundaries so that teams can work autonomously and accelerate the pace of innovation. The book also covers low-level event and data patterns that support the entire architecture, while getting you up and running with the different autonomous service design patterns. As you progress, you'll focus on best practices for security, reliability, testability, observability, and performance. Finally, the book combines all that you've learned, explaining the methodologies of continuous experimentation, deployment, and delivery before providing you with some final thoughts on how to start making progress. By the end of this book, you'll be able to architect your own event-driven, serverless systems that are ready to adapt and change so that you can deliver value at the pace needed by your business. What you will learn Explore architectural patterns to create anti-fragile systems that thrive with change Focus on DevOps practices that empower self-sufficient, full-stack teams Build enterprise-scale serverless systems Apply microservices principles to the frontend Discover how SOLID principles apply to software and database architecture Create event stream processors that power the event sourcing and CQRS pattern Deploy a multi-regional system, including regional health checks, latency-based routing, and replication Explore the Strangler pattern for migrating legacy systems Who this book is for This book is for software architects and aspiring software architects who want to learn about different patterns and best practices to design better software. Intermediate-level experience in software development and design is required. Beginner-level knowledge of the cloud will also help you get the most out of this software design book.

You want increased customer satisfaction, faster development cycles, and less wasted work. Domain-driven design (DDD) combined with functional programming is the innovative combo that will get you there. In this pragmatic, down-to-earth guide, you'll see how applying the core principles of functional programming can result in software designs that model real-world requirements both elegantly and concisely - often more so than an object-oriented approach. Practical examples in the open-source F# functional language, and examples from familiar business domains, show you how to apply these techniques to build software that is business-focused, flexible, and high quality. Domain-driven design is a well-established approach to designing software that ensures that domain experts and developers work together effectively to create high-quality software. This book is the first to combine DDD with techniques from statically typed functional programming. This book is perfect for newcomers to DDD or functional programming - all the techniques you need will be introduced and explained. Model a complex domain accurately using the F# type system, creating compilable code that is also readable documentation---ensuring that the code and design never get out of sync. Encode business rules in the design so that you have "compile-time unit tests," and eliminate many potential bugs by making illegal states unrepresentable. Assemble a series of small, testable functions into a complete use case, and compose these individual scenarios into a large-scale design. Discover why the combination of functional programming and DDD leads naturally to service-oriented and hexagonal architectures. Finally, create a functional domain model that works with traditional databases, NoSQL, and event stores, and safely expose your domain via a website or API. Solve real problems by focusing on real-world requirements for your software. What You Need: The code in this book is designed to be run interactively on

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Windows, Mac and Linux. You will need a recent version of F# (4.0 or greater), and the appropriate .NET runtime for your platform. Full installation instructions for all platforms at fsharp.org.

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

Real examples written in PHP showcasing DDD Architectural Styles, Tactical Design, and Bounded Context Integration About This Book Focuses on practical code rather than theory Full of real-world examples that you can apply to your own projects Shows how to build PHP apps using DDD principles Who This Book Is For This book is for PHP developers who want to apply a DDD mindset to their code. You should have a good understanding of PHP and some knowledge of DDD. This book doesn't dwell on the theory, but instead gives you the code that you need. What You Will Learn Correctly design all design elements of Domain-Driven Design with PHP Learn all tactical patterns to achieve a fully worked-out Domain-Driven Design Apply hexagonal architecture within your application Integrate bounded contexts in your applications Use REST and Messaging approaches In Detail Domain-Driven Design (DDD) has arrived in the PHP community, but for all the talk, there is very little real code. Without being in a training session and with no PHP real examples, learning DDD can be challenging. This book changes all that. It details how to implement tactical DDD patterns and gives full examples of topics such as integrating Bounded Contexts with REST, and DDD messaging strategies. In this book, the authors show you, with tons of details and examples, how to properly design Entities, Value Objects, Services, Domain Events, Aggregates, Factories, Repositories, Services, and Application Services with PHP. They show how to apply Hexagonal Architecture within your application whether you use an open source framework or your own. Style and approach This highly practical book shows developers how to apply domain-driven design principles to PHP. It is full of solid code examples to work through.

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

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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

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

MVC and CRUD make software easier to write, but harder to 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 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 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 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 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 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 specialized microservices for registration, authentication, payment processing, e-mail, and more. Tune your services by defining appropriate service boundaries. Deploy your services effectively for 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 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 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 extensive Docker knowledge is not required.

Describes ways to incorporate domain modeling into software development.

What separates the traditional enterprise from the likes of Amazon, Netflix, and Etsy? Those companies have refined the art of cloud native development to maintain their competitive edge and stay well ahead of the competition. This practical guide shows Java/JVM developers how to build better software, faster, using Spring Boot, Spring Cloud, and Cloud Foundry. Many organizations have already waded into cloud computing, test-driven development, microservices, and continuous integration and delivery. Authors Josh Long and Kenny Bastani fully immerse you in the tools and methodologies that will help you transform your legacy application into one that is genuinely cloud native. In four sections, this book takes you through: The Basics: learn the motivations behind cloud native thinking; configure and test a

Spring Boot application; and move your legacy application to the cloud Web Services: build HTTP and RESTful services with Spring; route requests in your distributed system; and build edge services closer to the data Data Integration: manage your data with Spring Data, and integrate distributed services with Spring's support for event-driven, messaging-centric architectures Production: make your system observable; use service brokers to connect stateful services; and understand the big ideas behind continuous delivery

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 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 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 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. 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 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 Decompose a system into bounded contexts Coordinate the work of multiple teams Gradually introduce DDD to brownfield projects "For software developers of all experience levels looking to improve their results, and design and implement domain-driven enterprise applications consistently with the best current state of professional practice, Implementing Domain-Driven Design will impart a treasure trove of knowledge hard won within the DDD and enterprise application architecture communities over the last couple decades." –Randy Stafford, Architect At-Large, Oracle Coherence Product Development "This book is a must-read for anybody looking to put DDD into practice." –Udi Dahan, Founder of NServiceBus Implementing Domain-Driven Design presents a top-down approach to understanding domain-driven design (DDD) in a way that fluently connects strategic patterns to fundamental tactical programming tools. Vaughn Vernon couples guided approaches to implementation with modern architectures, highlighting the importance and value of focusing on the business domain while balancing technical considerations. Building on Eric Evans' seminal book, Domain-Driven Design, the author presents practical DDD techniques through examples from familiar domains. Each principle is backed up by realistic Java examples—all applicable to C# developers—and all content is tied together by a single case study: the delivery of a large-scale Scrum-based SaaS system for a multitenant environment. The author takes you far beyond "DDD-lite" approaches that embrace DDD solely as a technical toolset, and shows you how to fully leverage DDD's "strategic design patterns" using Bounded Context, Context Maps, and the Ubiquitous Language. Using these techniques and examples, you can reduce time to market and improve quality, as you build software that is more flexible, more scalable, and more tightly aligned to business goals. Coverage includes Getting started the right way with DDD, so you can rapidly gain value from it Using DDD within diverse architectures, including Hexagonal, SOA, REST, CQRS, Event-Driven, and Fabric/Grid-Based Appropriately designing and applying Entities—and learning when to use Value Objects instead Mastering DDD's powerful new Domain Events technique Designing Repositories for ORM, NoSQL, and other databases

This book predominately covers Microservices architecture with real-world example which can help professionals with ease of adoption of this technology. Following the trend of modularity in real world, the idea behind Microservice by Examples is to allow developers to build their applications from various independent components which can be easily changed, removed or upgraded. Also, it is relevant now because of enterprises are moving towards DevOps/

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Modernization, this book will emphasize on containers and Dockers as well.

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