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Apply business requirements to IT infrastructure and deliver a high-quality product by understanding architectures such as microservices, DevOps, and cloud-native using modern C++ standards and features

Key Features

- Design scalable large-scale applications with the C++ programming language
- Architect software solutions in a cloud-based environment with continuous integration and continuous delivery (CI/CD)
- Achieve architectural goals by leveraging design patterns, language features, and useful tools

Book Description

Software architecture refers to the high-level design of complex applications. It is evolving just like the languages we use, but there are architectural concepts and patterns that you can learn to write high-performance apps in a high-level language without sacrificing readability and maintainability. If you're working with modern C++, this practical guide will help you put your knowledge to work and design distributed, large-scale apps. You'll start by getting up to speed with architectural concepts, including established patterns and rising trends, then move on to understanding what software architecture actually is and start exploring its components. Next, you'll discover the design concepts involved in application architecture and the patterns in software development, before going on to learn how to build, package, integrate, and deploy your components. In the concluding chapters, you'll explore different architectural qualities, such as maintainability, reusability, testability, performance, scalability, and security. Finally, you will get an overview of distributed systems, such as service-oriented architecture, microservices, and cloud-native, and understand how to apply them in application development. By the end of this book, you'll be able to build distributed services using modern C++ and associated tools to deliver solutions as per your clients' requirements.

What you will learn

- Understand how to apply the principles of software architecture
- Apply design patterns and best practices to meet your architectural goals
- Write elegant, safe, and performant code using the latest C++ features
- Build applications that are easy to maintain and deploy
- Explore the different architectural approaches and learn to apply them as per your requirements
- Simplify development and operations using application containers
- Discover various techniques to solve common problems in software design and development

Who this book is for

This software architecture C++ programming book is for experienced C++ developers looking to become software architects or develop enterprise-grade applications. Get expert architectural and design-level guidance for building distributed solutions with the Microsoft® .NET Framework—learning how to synthesize your knowledge of application development, servers, and infrastructure and business requirements. This guide assumes you are familiar with .NET component development and the basic principles of a layered distributed application design. It examines architectural issues and solution design for a range of project stakeholders—whether you build and design applications and services, recommend appropriate technologies and products for applications and services, make design decisions to meet functional and nonfunctional requirements, or choose appropriate communications mechanisms for applications and services—providing straightforward guidance, recommendations, and best practices gleaned from real-world solution development. All PATTERNS & PRACTICES guides are reviewed and approved by Microsoft engineering teams, consultants, partners, and customers—delivering accurate, real-world information that's been technically validated and tested. Intelligent readers who want to build their own embedded computer systems-- installed in everything from cell phones to cars to handheld organizers to refrigerators-- will find this book to be the most in-depth, practical, and up-to-date guide on the market.

Designing Embedded Hardware carefully steers between the practical and philosophical aspects, so developers can both create their own devices and gadgets and customize and extend off-the-shelf systems. There are hundreds of books to choose from if you need to learn programming, but only a few are available if you want to learn to create hardware. **Designing Embedded Hardware** provides software and hardware engineers with no prior experience in embedded systems with the necessary conceptual and design building blocks to understand the architectures of embedded systems. Written to provide the depth of coverage and real-world examples developers need, **Designing Embedded Hardware** also provides a road-map to the pitfalls and traps to avoid in designing embedded systems. **Designing Embedded Hardware** covers such essential topics as:

- The principles of developing computer hardware
- Core hardware designs
- Assembly language concepts
- Parallel I/O
- Analog-digital conversion
- Timers (internal and external)
- UART
- Serial Peripheral Interface
- Inter-Integrated Circuit
- Bus Controller Area Network (CAN)
- Data Converter Interface (DCI)
- Low-power operation

This invaluable and eminently useful book gives you the practical tools and skills to develop, build, and program your own application-specific computers. Architect and design highly scalable, robust, clean and highly performant applications in .NET

About This Book

- Incorporate architectural soft-skills such as DevOps and Agile methodologies to enhance program-level objectives
- Gain knowledge of architectural approaches on the likes of SOA architecture and microservices to provide traceability and rationale for architectural decisions
- Explore a variety of practical use cases and code examples to implement the tools and techniques described in the book

Who This Book Is For

This book is for experienced .NET developers who are aspiring to become architects of enterprise-grade applications, as well as software architects who would like to leverage .NET to create effective blueprints of applications.

What You Will Learn

- Grasp the important aspects and best practices of application lifecycle management
- Leverage the popular ALM tools, application insights, and their usage to monitor performance, testability, and optimization tools in an enterprise
- Explore various authentication models such as social media-based authentication, 2FA and OpenID Connect, learn authorization techniques
- Explore Azure with various solution approaches for Microservices and Serverless architecture along with Docker containers
- Gain knowledge about the recent market trends and practices and how they can be achieved with .NET Core and Microsoft tools and technologies

In Detail

If you want to design and develop enterprise applications using .NET Core as the development framework and learn about industry-wide best

practices and guidelines, then this book is for you. The book starts with a brief introduction to enterprise architecture, which will help you to understand what enterprise architecture is and what the key components are. It will then teach you about the types of patterns and the principles of software development, and explain the various aspects of distributed computing to keep your applications effective and scalable. These chapters act as a catalyst to start the practical implementation, and design and develop applications using different architectural approaches, such as layered architecture, service oriented architecture, microservices and cloud-specific solutions. Gradually, you will learn about the different approaches and models of the Security framework and explore various authentication models and authorization techniques, such as social media-based authentication and safe storage using app secrets. By the end of the book, you will get to know the concepts and usage of the emerging fields, such as DevOps, BigData, architectural practices, and Artificial Intelligence. Style and approach Filled with examples and use cases, this guide takes a no-nonsense approach to show you the best tools and techniques required to become a successful software architect. Manufacturing Architecture is the first reference guide to customizing repetitive manufacturing for architects. Computer-aided design has greatly expanded the opportunities for architects to create innovative buildings with custom components. While most architects were exposed to CAD when they were students, few of them have in-depth knowledge or experience with using it to customize repetitive manufacturing processes. This book provides designers of all levels with all the information they need to make the most of the exciting opportunities offered by custom manufacturing. Clear diagrams and narratives explain the 20 most useful manufacturing processes for typical building components. Case studies from around the globe show how these processes can be customized in order to create variation, lower costs, decrease production waste, and use a wider selection of materials. With over 1,000 images, including photographs and hundreds of specially created diagrams, Manufacturing Architecture is as inspiring as it is useful. As we pointed out in The Architecture of Open Source Applications, architects look at thousands of buildings during their training, and study the critiques of many more. But most software developers only ever get to know a handful of programs well - usually programs they wrote themselves. This book provides you with the chance to study how 26 experienced programmers think when they are building something new. The programs you will read about in this book were all written from scratch to solve difficult problems. A web server, a pedometer, a Python interpreter, a web-based spreadsheet, and many more applications are written, in 500 lines of code or less, and described by their creators so that you can learn from their insights and their mistakes. In-depth examination of concepts and principles of Web application development Completely revised and updated, this popular book returns with coverage on a range of new technologies. Authored by a highly respected duo, this edition provides an in-depth examination of the core concepts and general principles of Web application development. Packed with examples featuring specific technologies, this book is divided into three sections: HTTP protocol as a foundation for Web applications, markup languages (HTML, XML, and CSS), and survey of emerging technologies. After a detailed introduction to the history of Web applications, coverage segues to core Internet protocols, Web browsers, Web application development, trends and directions, and more. Includes new coverage on technologies such as application primers, Ruby on Rails, SOAP, XPath, P3P, and more Explores the fundamentals of HTTP and its evolution Looks at HTML and its roots as well as XML languages and applications Reviews the basic operation of Web Servers, their functionality, configuration, and security Discusses how to process flow in Web browsers and looks at active browser pages Addresses the trends and various directions that the future of Web application frameworks may be headed This book is essential reading for anyone who needs to design or debug complex systems, and it makes it easier to learn the new application programming interfaces that arise in a rapidly changing Internet environment. Gain insight into how hexagonal architecture can help to keep the cost of development low over the complete lifetime of an application Key FeaturesExplore ways to make your software flexible, extensible, and adaptableLearn new concepts that you can easily blend with your own software development styleDevelop the mindset of building maintainable solutions instead of taking shortcutsBook Description We would all like to build software architecture that yields adaptable and flexible software with low development costs. But, unreasonable deadlines and shortcuts make it very hard to create such an architecture. Get Your Hands Dirty on Clean Architecture starts with a discussion about the conventional layered architecture style and its disadvantages. It also talks about the advantages of the domain-centric architecture styles of Robert C. Martin's Clean Architecture and Alistair Cockburn's Hexagonal Architecture. Then, the book dives into hands-on chapters that show you how to manifest a hexagonal architecture in actual code. You'll learn in detail about different mapping strategies between the layers of a hexagonal architecture and see how to assemble the architecture elements into an application. The later chapters demonstrate how to enforce architecture boundaries. You'll also learn what shortcuts produce what types of technical debt and how, sometimes, it is a good idea to willingly take on those debts. After reading this book, you'll have all the knowledge you need to create applications using the hexagonal architecture style of web development. What you will learnIdentify potential shortcomings of using a layered architectureApply methods to enforce architecture boundariesFind out how potential shortcuts can affect the software architectureProduce arguments for when to use which style of architectureStructure your code according to the architectureApply various types of tests that will cover each element of the architectureWho this book is for This book is for you if you care about the architecture of the software you are building. To get the most out of this book, you must have some experience with web development. The code examples in this book are in Java. If you are not a Java programmer but can read object-oriented code in other languages, you will be fine. In the few places where Java or framework specifics are needed, they are thoroughly explained. Salary surveys worldwide regularly place software architect in the top 10 best jobs, yet no real guide exists to help developers become architects. Until now. This book provides the first comprehensive overview of software architecture's many aspects. Aspiring and existing architects alike will examine architectural characteristics, architectural patterns, component determination, diagramming and presenting architecture, evolutionary architecture, and many other topics. Mark Richards and Neal Ford—hands-on practitioners who have taught software architecture classes professionally for years—focus on architecture principles that apply across all technology stacks. You'll explore software architecture in a

modern light, taking into account all the innovations of the past decade. This book examines: Architecture patterns: The technical basis for many architectural decisions Components: Identification, coupling, cohesion, partitioning, and granularity Soft skills: Effective team management, meetings, negotiation, presentations, and more Modernity: Engineering practices and operational approaches that have changed radically in the past few years Architecture as an engineering discipline: Repeatable results, metrics, and concrete valuations that add rigor to software architecture "Demystifies object-oriented programming, and lays out how to use it to design truly secure and performant applications." —Charles Soetan, Plum.io Key Features Dozens of techniques for writing object-oriented code that's easy to read, reuse, and maintain Write code that other programmers will instantly understand Design rules for constructing objects, changing and exposing state, and more Examples written in an instantly familiar pseudocode that's easy to apply to Java, Python, C#, and any object-oriented language Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About The Book Well-written object-oriented code is easy to read, modify, and debug. Elevate your coding style by mastering the universal best practices for object design presented in this book. These clearly presented rules, which apply to any OO language, maximize the clarity and durability of your codebase and increase productivity for you and your team. In Object Design Style Guide, veteran developer Matthias Noback lays out design rules for constructing objects, defining methods, and much more. All examples use instantly familiar pseudocode, so you can follow along in the language you prefer. You'll go case by case through important scenarios and challenges for object design and then walk through a simple web application that demonstrates how different types of objects can work together effectively. What You Will Learn Universal design rules for a wide range of objects Best practices for testing objects A catalog of common object types Changing and exposing state Test your object design skills with exercises This Book Is Written For For readers familiar with an object-oriented language and basic application architecture. About the Author Matthias Noback is a professional web developer with nearly two decades of experience. He runs his own web development, training, and consultancy company called "Noback's Office." Table of Contents: 1 | Programming with objects: A primer 2 | Creating services 3 | Creating other objects 4 | Manipulating objects 5 | Using objects 6 | Retrieving information 7 | Performing tasks 8 | Dividing responsibilities 9 | Changing the behavior of services 10 | A field guide to objects 11 | Epilogue "A comprehensive overview of the challenges teams face when moving to microservices, with industry-tested solutions to these problems." - Tim Moore, Lightbend 44 reusable patterns to develop and deploy reliable production-quality microservices-based applications, with worked examples in Java Key Features 44 design patterns for building and deploying microservices applications Drawing on decades of unique experience from author and microservice architecture pioneer Chris Richardson A pragmatic approach to the benefits and the drawbacks of microservices architecture Solve service decomposition, transaction management, and inter-service communication Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About The Book Microservices Patterns teaches you 44 reusable patterns to reliably develop and deploy production-quality microservices-based applications. This invaluable set of design patterns builds on decades of distributed system experience, adding new patterns for composing services into systems that scale and perform under real-world conditions. More than just a patterns catalog, this practical guide with worked examples offers industry-tested advice to help you design, implement, test, and deploy your microservices-based application. What You Will Learn How (and why!) to use microservices architecture Service decomposition strategies Transaction management and querying patterns Effective testing strategies Deployment patterns This Book Is Written For Written for enterprise developers familiar with standard enterprise application architecture. Examples are in Java. About The Author Chris Richardson is a Java Champion, a JavaOne rock star, author of Manning's POJOs in Action, and creator of the original CloudFoundry.com. Table of Contents Escaping monolithic hell Decomposition strategies Interprocess communication in a microservice architecture Managing transactions with sagas Designing business logic in a microservice architecture Developing business logic with event sourcing Implementing queries in a microservice architecture External API patterns Testing microservices: part 1 Testing microservices: part 2 Developing production-ready services Deploying microservices Refactoring to microservices 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 Flash Remoting MX lets developers easily integrate rich Macromedia Flash content with applications that are built using Macromedia ColdFusion MX, Microsoft .NET, Java, PHP, or SOAP-based web services. The result is complex client/server applications that more closely resemble desktop applications than traditional web pages. Gone is the click/wait/reload approach of HTML. Your web application uses Flash as the front end while Flash Remoting handles the communication behind the scenes with the application server. All the end user knows is that it's fast and flexible. The potential uses for Flash Remoting are endless. Flash Remoting: The Definitive Guide will help you understand this breakthrough technology and use it to build your own Rich Internet Applications (RIAs). Build applications that connect to a database, file system, or other server-side technologies. Or, use Flash Remoting to create: online stores that feature catalogs and shopping cart systems sound and video clip libraries banner ads with built-in shopping carts, click-through tracking, and site search capabilities new controls that can be used in place of HTML extensions to Flash, Dreamweaver, Fireworks, and more front-ends to databases for administrators The book begins with Flash Remoting basics: setup, installation and

an introduction to its underlying concepts. Next, you'll explore the Flash's User Interface components as they relate to Flash Remoting. Then, you'll gain insights into Flash Remoting internals and the Remoting API. The book is rich with examples that you will be able to run on your own system. The next section focuses on the server-side environment that you'll use for your applications. Individual chapters cover Flash Remoting with ColdFusion, Server-Side ActionScript, Java, ASP.NET, and PHP. The last section covers more advanced Flash Remoting techniques, such as calling web services from Flash Remoting, extending objects and UI controls, best practices, and debugging. Plus there is a detailed chapter demonstrating a real-world application. The book concludes with a Flash Remoting API reference. Developers who are looking to create Rich Internet Applications with Flash will find Flash Remoting: The Definitive Guide indispensable. A comprehensive guide to exploring software architecture concepts and implementing best practices

Key Features Enhance your skills to grow your career as a software architect

Design efficient software architectures using patterns and best practices Learn how software architecture relates to an organization as well as software development methodology

Book Description The Software Architect's Handbook is a comprehensive guide to help developers, architects, and senior programmers advance their career in the software architecture domain. This book takes you through all the important concepts, right from design principles to different considerations at various stages of your career in software architecture. The book begins by covering the fundamentals, benefits, and purpose of software architecture. You will discover how software architecture relates to an organization, followed by identifying its significant quality attributes. Once you have covered the basics, you will explore design patterns, best practices, and paradigms for efficient software development. The book discusses which factors you need to consider for performance and security enhancements. You will learn to write documentation for your architectures and make appropriate decisions when considering DevOps. In addition to this, you will explore how to design legacy applications before understanding how to create software architectures that evolve as the market, business requirements, frameworks, tools, and best practices change over time. By the end of this book, you will not only have studied software architecture concepts but also built the soft skills necessary to grow in this field. What you will learn

Design software architectures using patterns and best practices Explore the different considerations for designing software architecture

Discover what it takes to continuously improve as a software architect Create loosely coupled systems that can support change

Understand DevOps and how it affects software architecture Integrate, refactor, and re-architect legacy applications

Who this book is for The Software Architect's Handbook is for you if you are a software architect, chief technical officer (CTO), or senior developer looking to gain a firm grasp of software architecture. Do you need to learn about cloud computing architecture with Microsoft's Azure quickly? Read this book! It gives you just enough info on the big picture and is filled with key terminology so that you can join the discussion on cloud architecture. Software services are established as a programming concept, but their impact on the overall architecture of enterprise IT and business operations is not well-understood. This has led to problems in deploying SOA, and some disillusionment. The SOA Source Book adds to this a collection of reference material for SOA. It is an invaluable resource for enterprise architects working with SOA. The SOA Source Book will help enterprise architects to use SOA effectively. It explains: What SOA is How to evaluate SOA features in business terms How to model SOA How to use The Open Group Architecture Framework (TOGAF™) for SOA SOA governance This book explains how TOGAF can help to make an Enterprise Architecture. Enterprise Architecture is an approach that can help management to understand this growing complexity. Spending on worldwide wireless and mobile network infrastructure will rise by \$10.7 billion between 2002 and 2007. In this new resource, the authors provide technology-independent principles and practices that no mobile application developer should be without. This book illustrates specific details of mobile technologies and includes mobile application case studies. This is the eagerly-anticipated revision to one of the seminal books in the field of software architecture which clearly defines and explains the topic.

- Contains the most depth and breadth of coverage of any book on SQL Server architecture, internals, and tuning
- Will be a key reference for anyone working with SQL Server, no matter what their skill level
- The latest book in the bestselling series of Guru's Guides from Ken Henderson

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!

IBM® API Connect is an API management solution from IBM that offers capabilities to create, run, manage, and secure APIs and microservices. By using these capabilities, the full lifecycle of APIs for on-premises and cloud environments can be managed. This IBM Redpaper™ publication describes practical scenarios that show the API Connect capabilities for managing the full API life cycle, creating, running, securing, and managing the APIs. This Redpaper publication is targeted to users of an API Connect based API strategy, developers, IT architects, and technical evangelists. If you are not familiar with APIs or API Connect, we suggest that you read the Redpaper publication Getting Started with IBM API Connect: Concepts, Architecture and Strategy Guide, REDP-5349, before reading this publication. Discover an accessible pathway to advancing your career and becoming a web architect by building a solid technical ground in software architecture

Key Features Follow your desired career path that leads to a lucrative job as a web architect

Develop a solid technical background in software architecture using

real-world practices and patterns Learn proven techniques and design considerations from an industry expert Book Description Large-scale web applications require you to write code efficiently following business and architectural considerations. They require web developers to understand the impact of their work on the system and how they can evolve the product. With this handbook, every developer will find something to take away. This book will help web developers looking to change projects or work on a new project in understanding the context of the application, along with how some design decisions or patterns fit better in their application's architecture. It acts as a guide, taking you through different levels of professional growth with a focus on best practices, coding guidelines, business considerations, and soft skills that will help you gain the knowledge to craft a career in web development. Finally, you'll work with examples and ways of applying the discussed concepts in practical situations. By the end of this book, you'll have gained valuable insights into what it means to be a web architect, as well as the impact architecture has on a web application. What you will learn Understand the context of software architecture, from shaping the product to delivery and beyond Become well versed in what a web architect's role means Explore go-to key concepts for every time you try your hand at app development Analyze the importance of relationships with stakeholders Get acquainted with the benefits of well-designed architecture Dig into and solve myths web developers have come across or created along the way Who this book is for This book is for web developers who want to become web architects. Beginner-level web developers will be able to develop a strong technical background, and experienced web developers will learn techniques to become better professionals by understanding the web architect's role and the impact of efficient architecture on their projects. Explores options for using J2EE technologies in the creation of scalable software, providing a case study on a database and focusing on selecting leading-edge technologies and implementing the sample system. Gain a 360-degree view of Microsoft Power Platform and combine the benefits of Power Apps, Power BI, Power Automate, Azure, and Dynamics 365 to build an enterprise application platform for your organization Key FeaturesExplore various Microsoft cloud components and find out how they can enhance your Power Platform solutionsGet to grips with Microsoft Power Platform's security and extensibility, integration, and data migration modelsDiscover architectural best practices for designing complex enterprise solutionsBook Description For forward-looking architects and decision makers who want to craft complex solutions to serve growing business needs, Microsoft Power Platform Enterprise Architecture offers an array of architectural best practices and techniques. With this book, you'll learn how to design robust software using the tools available in the Power Platform suite and be able to integrate them seamlessly with various Microsoft 365 and Azure components. Unlike most other resources that are overwhelmingly long and unstructured, this book covers essential concepts using concise yet practical examples to help you save time. You'll develop the skills you need to architect, design, and manage a complex solution as you follow the journey of a fictitious enterprise customer as they enter the world of Power Platform. Throughout the book, you'll discover how to combine the functionality of Power Apps, Power Automate, Power BI, and Power Virtual Agents with various methodologies to effectively address application lifecycle management, security, and extensibility. Finally, you'll learn how to overcome common challenges in migrating data to and from Microsoft Power Platform using proven techniques. By the end of this book, you'll have the strategic perspective of an enterprise architect to make accurate architectural decisions for your complex Power Platform projects. What you will learnUnderstand various Dynamics 365 CRM, ERP, and AI modules for creating Power Platform solutionsEnhance Power Platform with Microsoft 365 and AzureFind out which regions, staging environments, and user licensing groups need to be employed when creating enterprise solutionsImplement sophisticated security by using various authentication and authorization techniquesExtend Power Apps, Power BI, and Power Automate to create custom applicationsIntegrate your solution with various in-house Microsoft components or third-party systems using integration patternsWho this book is for This book is for enterprise architects and technical decision makers who want to craft complex solutions using Microsoft Power Platform to serve growing business needs and to stay competitive in the modern IT world. A basic understanding of Microsoft Power Platform will help you to get started with this book. 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. "I'm dancing! By god I'm dancing on the walls. I'm dancing on the ceiling. I'm ecstatic. I'm overjoyed. I'm really, really pleased." —From the Foreword by Robert C. Martin (a.k.a. Uncle Bob) This isn't the first book on Java application architecture. No doubt it won't be the last. But rest assured, this title is different. The way we develop Java applications is about to change, and this title explores the new way of Java application architecture. Over the past several years, module frameworks have been gaining traction on the Java platform, and upcoming versions of Java will include a module system that allows you to leverage the power of modularity to build more resilient and flexible software systems. Modularity isn't a new concept. But modularity will change the way we

develop Java applications, and you'll only be able to realize the benefits if you understand how to design more modular software systems. Java Application Architecture will help you Design modular software that is extensible, reusable, maintainable, and adaptable Design modular software today, in anticipation of future platform support for modularity Break large software systems into a flexible composite of collaborating modules Understand where to place your architectural focus Migrate large-scale monolithic applications to applications with a modular architecture Articulate the advantages of modular software to your team Java Application Architecture lays the foundation you'll need to incorporate modular design thinking into your development initiatives. Before it walks you through eighteen patterns that will help you architect modular software, it lays a solid foundation that shows you why modularity is a critical weapon in your arsenal of design tools. Throughout, you'll find examples that illustrate the concepts. By designing modular applications today, you are positioning yourself for the platform and architecture of tomorrow. That's why Uncle Bob is dancing. This book is your systematic cloud migration guide. Experiences shared by the author are drawn from real-life migration projects and contain practical advice, as well as step-by-step architecture, design, and technical implementation instructions using sample application code on GitLab. Following the guidance in this book will provide much needed support to your teams, and help you successfully complete the application cloud migration journey. Systematic Cloud Migration consists of four major parts. Part one starts with a fundamental introduction of cloud computing to establish the context for migration, including paradigm changes in five important areas: software application, DevSecOps, operations, infrastructure, and security. And these are the areas that the book follows throughout. Next, it introduces a real-life migration process that your team can follow. Part two presents the migration process for the application code, including architecture diagrams and presented by demo application code and supporting infrastructure in AWS cloud. Part three dives into DevSecOps and automation. In addition to concepts, a real-life migration diagram and sample pipeline code implemented with GitLab are include. Part four deals with efficient cloud operations. Each chapter has a practical structure: objectives, roles, inputs, process/activities, outputs/deliverables, best practices, and summary. There is a wealth of cloud production-grade template style artifacts that can be used as is. What You Will Learn Design applications in the cloud, including determining the design criteria (e.g., solution cost is a design criterion, same as security, and is not an afterthought) Understand the major migration areas: software development (application code, data, integration, and configuration), software delivery (pipeline and automation), and software operations (observability) Migrate each application element: client and business components code, data, integration and services, logging, monitoring, alerting, as well as configurations Understand cloud-critical static application security testing (SAST), dynamic application security testing (DAST), containers compliance and security scanning, and open source dependency testing Know the directions and implementation details on cost-efficient, automated, cloud-native software operations Who This Book Is For Primarily designed with software developers, team leads, development managers, DevOps engineers, and software architects in mind. Their day-to-day activities include architecting, designing, developing, delivering, and operating software in the cloud environment. In addition, this book will benefit infrastructure, network, security, and operations engineers, who in turn, can provide better support for the software development product teams. If you're involved in planning IT infrastructure as a network or system architect, system administrator, or developer, this book will help you adapt your skills to work with these highly scalable, highly redundant infrastructure services. While analysts hotly debate the advantages and risks of cloud computing, IT staff and programmers are left to determine whether and how to put their applications into these virtualized services. Cloud Application Architectures provides answers -- and critical guidance -- on issues of cost, availability, performance, scaling, privacy, and security. With Cloud Application Architectures, you will: Understand the differences between traditional deployment and cloud computing Determine whether moving existing applications to the cloud makes technical and business sense Analyze and compare the long-term costs of cloud services, traditional hosting, and owning dedicated servers Learn how to build a transactional web application for the cloud or migrate one to it Understand how the cloud helps you better prepare for disaster recovery Change your perspective on application scaling To provide realistic examples of the book's principles in action, the author delves into some of the choices and operations available on Amazon Web Services, and includes high-level summaries of several of the other services available on the market today. Cloud Application Architectures provides best practices that apply to every available cloud service. Learn how to make the transition to the cloud and prepare your web applications to succeed. The software development ecosystem is constantly changing, providing a constant stream of new tools, frameworks, techniques, and paradigms. Over the past few years, incremental developments in core engineering practices for software development have created the foundations for rethinking how architecture changes over time, along with ways to protect important architectural characteristics as it evolves. This practical guide ties those parts together with a new way to think about architecture and time. Develop and extend efficient cloud-native applications with ServiceNow About This Book Build and customize your apps and workflows to suit your organization's requirements Perform in-depth application development from designing forms to writing business rules, client-scripts, and workflows Comprehensive guide to the end-to-end implementation of designing and extending apps with ServiceNow Who This Book Is For If you are a ServiceNow administrator and developer and need to build and customize your service management solution (apps and workflows) with ServiceNow, then this book is for you. What You Will Learn Customize the ServiceNow dashboard to meet your business requirements Use Administration and Security Controls to add roles and ensure proper access Manage tables and columns using data dictionaries Learn how application scopes are defined within ServiceNow Configure different types of table to design your application Start using the different types of scripting options available in ServiceNow Design and create workflows for task tables Use debugging techniques available in ServiceNow to easily resolve script-related issues Run scripts at regular time intervals using the Scheduled Script Execution module In Detail ServiceNow provides service management for every department in the enterprise, including IT, Human Resources, Facilities, Field Service, and more. This book focuses on all the steps required to develop apps and workflows for any of your business requirements using ServiceNow. You will start with the first module, which covers the

basics of ServiceNow and how applications are structured; how you can customize the dashboard as required; and also how to create users. After you get used to the dashboard, you will move on to the next module, Applications and Tables, where you will learn about working with different tables and how you can create a scope other than the global scope for your application. The next module is Scripting and APIs, where you will learn Scripting in ServiceNow and use powerful APIs to develop applications. The final module, Administration Essentials, covers debugging, advanced database features, and scheduled script creation. By the end of the book you will have mastered creating organized and customer-friendly applications.

Style and approach A step-by-step tutorial to designing applications and workflows with ServiceNow

Providing a foundation for enterprise architects on the principles of service-oriented architecture, this text offers guidance on how to begin transitioning an IT infrastructure toward the SOA model, an operation tightly integrated into business processes and operations. An unprecedented opportunity to learn from the experts at one of the world's most prestigious m-commerce solutions providers One of the top management and IT consulting firms in the world, Cap Gemini Ernst & Young (CGEY) develops cutting-edge wireless and enterprise IT solutions for many of the Fortune 1000 companies. This book offers application developers and architects, network engineers, and other IT professionals an unprecedented opportunity to benefit from the experiences of key members of CGEY's m-commerce and mobile/wireless groups. Using in-depth case studies detailing recent CGEY wireless projects, the authors share the lessons they've learned about architecting m-commerce applications. They also provide architects with a wealth of practical information on troubleshooting technical solutions within the business deployment infrastructure. * The first technical book on wireless strategy from one of the "Big 5" consulting firms * Provides leading technical experiences to help architects troubleshoot solutions from lessons learned from CGEY's finance and commerce projects

As the digital economy changes the rules of the game for enterprises, the role of software and IT architects is also transforming. Rather than focus on technical decisions alone, architects and senior technologists need to combine organizational and technical knowledge to effect change in their company's structure and processes. To accomplish that, they need to connect the IT engine room to the penthouse, where the business strategy is defined. In this guide, author Gregor Hohpe shares real-world advice and hard-learned lessons from actual IT transformations. His anecdotes help architects, senior developers, and other IT professionals prepare for a more complex but rewarding role in the enterprise. This book is ideal for:

- Software architects and senior developers looking to shape the company's technology direction or assist in an organizational transformation
- Enterprise architects and senior technologists searching for practical advice on how to navigate technical and organizational topics
- CTOs and senior technical architects who are devising an IT strategy that impacts the way the organization works
- IT managers who want to learn what's worked and what hasn't in large-scale transformation

A practical guide for software architects and Java developers to build cloud-native hexagonal applications using Java and Quarkus to create systems that are easier to refactor, scale, and maintain

Key Features

- Learn techniques to decouple business and technology code in an application
- Apply hexagonal architecture principles to produce more organized, coherent, and maintainable software
- Minimize technical debts and tackle complexities derived from multiple teams dealing with the same code base

Book Description Hexagonal architecture enhances developers' productivity by decoupling business code from technology code, making the software more change-tolerant, and allowing it to evolve and incorporate new technologies without the need for significant refactoring. By adhering to hexagonal principles, you can structure your software in a way that reduces the effort required to understand and maintain the code. This book starts with an in-depth analysis of hexagonal architecture's building blocks, such as entities, use cases, ports, and adapters. You'll learn how to assemble business code in the Domain hexagon, create features by using ports and use cases in the Application hexagon, and make your software compatible with different technologies by employing adapters in the Framework hexagon. Moving on, you'll get your hands dirty developing a system based on a real-world scenario applying all the hexagonal architecture's building blocks. By creating a hexagonal system, you'll also understand how you can use Java modules to reinforce dependency inversion and ensure the isolation of each hexagon in the architecture. Finally, you'll get to grips with using Quarkus to turn your hexagonal application into a cloud-native system. By the end of this hexagonal architecture book, you'll be able to bring order and sanity to the development of complex and long-lasting applications. What you will learn

- Find out how to assemble business rules algorithms using the specification design pattern
- Combine domain-driven design techniques with hexagonal principles to create powerful domain models
- Employ adapters to make the system support different protocols such as REST, gRPC, and WebSocket
- Create a module and package structure based on hexagonal principles
- Use Java modules to enforce dependency inversion and ensure isolation between software components
- Implement Quarkus DI to manage the life cycle of input and output ports

Who this book is for This book is for software architects and Java developers who want to improve code maintainability and enhance productivity with an architecture that allows changes in technology without compromising business logic, which is precisely what hexagonal architecture does. Intermediate knowledge of the Java programming language and familiarity with Jakarta EE will help you to get the most out of this book. This book addresses what software architects and developers need to know in order to build applications based on blockchain technology, by offering an architectural view of software systems that make beneficial use of blockchains. It provides guidance on assessing the suitability of blockchain, on the roles blockchain can play in an architecture, on designing blockchain applications, and on assessing different architecture designs and tradeoffs. It also serves as a reference on blockchain design patterns and design analysis, and refers to practical examples of blockchain-based applications. The book is divided into four parts: Part I provides a general introduction to the topic and to existing blockchain platforms including Bitcoin, Ethereum, and Hyperledger Fabric, and offers examples of blockchain-based applications. Part II focuses on the functional aspects of software architecture, describing the main roles blockchain can play in an architecture, as well as its potential suitability and design process. It includes a catalogue of 15 design patterns and details how to use model-driven engineering to build blockchain-based applications. Part III covers the non-functional aspects of blockchain applications, which are cross-cutting concerns including cost, performance, security, and availability. Part IV then presents three detailed real-world use cases,

offering additional insights from a practical perspective. An epilogue summarizes the book and speculates on the role blockchain and its applications can play in the future. This book focusses on the bigger picture for blockchain, covering the concepts and technical considerations in the design of blockchain-based applications. The use of mathematical formulas is limited to where they are critical. This book is primarily intended for developers, software architects and chief information officers who need to understand the basic technology, tools and methodologies to build blockchain applications. It also provides students and researchers new to this field an introduction to this hot topic. Get the definitive guide on designing applications on the Microsoft application platform—straight from the Microsoft patterns & practices team. Learn how to choose the most appropriate architecture and the best implementation technologies that the Microsoft application platform offers applications developers. Get critical design recommendations and guidelines organized by application type—from Web, mobile, and rich Internet applications to Office Business Applications. You™ll also get links to additional technical resources that can help with your application development. Intel® Xeon Phi™ Coprocessor Architecture and Tools: The Guide for Application Developers provides developers a comprehensive introduction and in-depth look at the Intel Xeon Phi coprocessor architecture and the corresponding parallel data structure tools and algorithms used in the various technical computing applications for which it is suitable. It also examines the source code-level optimizations that can be performed to exploit the powerful features of the processor. Xeon Phi is at the heart of world's fastest commercial supercomputer, which thanks to the massively parallel computing capabilities of Intel Xeon Phi processors coupled with Xeon Phi coprocessors attained 33.86 teraflops of benchmark performance in 2013. Extracting such stellar performance in real-world applications requires a sophisticated understanding of the complex interaction among hardware components, Xeon Phi cores, and the applications running on them. In this book, Rezaur Rahman, an Intel leader in the development of the Xeon Phi coprocessor and the optimization of its applications, presents and details all the features of Xeon Phi core design that are relevant to the practice of application developers, such as its vector units, hardware multithreading, cache hierarchy, and host-to-coprocessor communication channels. Building on this foundation, he shows developers how to solve real-world technical computing problems by selecting, deploying, and optimizing the available algorithms and data structure alternatives matching Xeon Phi's hardware characteristics. From Rahman's practical descriptions and extensive code examples, the reader will gain a working knowledge of the Xeon Phi vector instruction set and the Xeon Phi microarchitecture whereby cores execute 512-bit instruction streams in parallel. Recent years have seen major changes in the approach to Computer Aided Design (CAD) in the architectural, engineering and construction (AEC) sector. CAD is increasingly becoming a standard design tool, facilitating lower development costs and a reduced design cycle. Not only does it allow a designer to model designs in two and three dimensions but also to model other dimensions, such as time and cost into designs. Computer Aided Design Guide for Architecture, Engineering and Construction provides an in-depth explanation of all the common CAD terms and tools used in the AEC sector. It describes each approach to CAD with detailed analysis and practical examples. Analysis is provided of the strength and weaknesses of each application for all members of the project team, followed by review questions and further tasks. Coverage includes: 2D CAD 3D CAD 4D CAD nD modelling Building Information Modelling parametric design, virtual reality and other areas of future expansion. With practical examples and step-by step guides, this book is essential reading for students of design and construction, from undergraduate level onwards. 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