Devops A Software Architects Perspective Sei Series In Software Engineering

The Most Complete, Practical, and Actionable Guide to Microservices Going beyond mere theory and marketing hype, Eberhard Wolff presents all the knowledge you need to capture the full benefits of this emerging paradigm. He illuminates microservice concepts, architectures, and scenarios from a technology-neutral standpoint, and demonstrates how to implement them with today's leading technologies such as Docker, Java, Spring Boot, the Netflix stack, and Spring Cloud. The author fully explains the benefits and tradeoffs associated with microservices, and guides you through the entire project lifecycle: development, testing, deployment, operations, and more. You'll find best practices for architecting microservice-based systems, individual microservices, and nanoservices, each illuminated with pragmatic examples. The author supplements opinions based on his experience with concise essays from other experts, enriching your understanding and illuminating areas where experts disagree. Readers are challenged to experiment on their own the concepts explained in the book to gain hands-on experience. Discover what microservices are, and how they differ from other forms of modularization Modernize legacy applications and efficiently build new systems Drive more value from continuous delivery with microservices Learn how microservices differ from SOA Optimize the microservices project lifecycle Plan, visualize, manage, and evolve architecture Integrate and communicate among microservices Apply advanced architectural techniques, including CQRS and Event Sourcing Maximize resilience and stability Operate and monitor microservices in production Build a full implementation with Docker, Java, Spring Boot, the Netflix stack, and Spring Cloud Explore nanoservices with Amazon Lambda, OSGi, Java EE, Vert.x, Erlang, and Seneca Understand microservices' impact on teams, technical leaders, product owners, and stakeholders Managers will discover better ways to support microservices, and learn how adopting the method affects the entire organization. Developers will master the technical skills and concepts they need to be effective. Architects will gain a deep understanding of key issues in creating or migrating toward microservices, and exactly what it will take to transform their plans into reality.

Today's programmers don't develop software systems from scratch. instead, they spend their time fixing, extending, modifying, and enhancing existing software. Legacy systems often turn into an unwieldy mess that becomes increasingly difficult to modify, and with architecture that continually accumulates technical debt. Carola Lilienthal has analyzed more than 300 software systems written in Java, C#, C++, PHP, ABAP, and TypeScript and, together with her teams, has successfully refactored them. This book condenses her experience with monolithic systems, architectural and design patterns, layered architectures, domain-driven design, and microservices. With more than 200 color images from real-world systems, good and sub-optimal sample solutions are presented in a comprehensible and thorough way, while recommendations and suggestions based on practical projects allow the reader to directly apply the author's knowledge to their daily work. "Throughout the book, Dr. Lilienthal has provided sound advice on diagnosing, understanding, disentangling, and ultimately preventing the issues that make software systems brittle and subject to breakage. In addition to the technical examples that you'd expect in a book on software architecture, she takes the time to dive into the behavioral and human aspects that impact sustainability and, in my experience, are inextricably linked to the health of a codebase. She also expertly zooms out, exploring architecture concepts such as domains and layers, and then zooms in to the class level where your typical developer works day-to-day. This holistic approach is crucial for implementing long-lasting change." From the Foreword of Andrea Goulet CEO, Corgibytes, Founder, Legacy Code Rocks

Software Systems Architecture, Second Edition is a highly regarded, practitioner-oriented guide to designing and implementing effective architectures for information systems. It is both a readily accessible introduction to software architecture and an invaluable handbook of well-established best practices. With this book you will learn how to Design and communicate an architecture that reflects and balances the different needs of its stakeholders Focus on architecturally significant aspects of design, including frequently overlooked areas such as performance, resilience, and location Use scenarios and patterns to drive the creation and validation of your architecture Document your architecture as a set of related views Reflecting new standards and developments in the field, this new edition extends and updates much of the content, and Adds a “system context viewpoint” that documents the system's interactions with its environment Expands the discussion of architectural principles, showing how they can be used to provide traceability and rationale for architectural decisions Explains how agile development and architecture can work together Positions requirements and architecture activities in the project context Presents a new lightweight method for architectural validation Whether you are an aspiring or practicing software architect, you will find yourself referring repeatedly to the practical advice in this book throughout the lifecycle of your projects. A supporting Web site containing further information can be found at www.viewpoints-and-perspectives.info.

Continuous Architecture provides a broad architectural perspective for continuous delivery, and describes a new architectural approach that supports and enables it. As the pace of innovation and software releases increases, IT departments are tasked to deliver value quickly and inexpensively to their business partners. With a focus on getting software into end-users hands faster, the ultimate goal of daily software updates is in sight to allow teams to ensure that they can release every change to the system simply and efficiently. This book presents an architectural approach to support modern application delivery methods and provide a broader architectural perspective, taking architectural concerns into account when deploying agile or continuous delivery approaches. The authors explain how to solve the challenges of implementing continuous delivery at the project and enterprise level, and the impact on IT processes including application testing, software deployment and software architecture. Covering the application of enterprise and software architecture concepts to the Agile and Continuous Delivery models Explains how to create an architecture that can evolve with applications Incorporates techniques including refactoring, architectural analysis, testing, and feedback-driven development Provides insight into incorporating modern software development when structuring teams and organizations

More and more Agile projects are seeking architectural roots as they struggle with complexity and scale - and they're seeking lightweight ways to do it Still seeking? In this book the authors help you to find your own path Taking cues from Lean development, they can help steer your project toward practices with longstanding track records Up-front architecture? Sure. You can deliver an architecture as code that compiles and that concretely guides development without bogging it down in a mass of documents and guesses about the implementation Documentation? Even a whiteboard diagram, or a CRC card, is documentation: the goal isn't to avoid documentation, but to document just the right things in just the right amount Process? This all works within the frameworks of Scrum, XP, and other Agile approaches Describes ways to incorporate domain modeling into software development.

This book provides practical guidance for adopting a high velocity, continuous delivery process to create reliable, scalable, Software-as-a-Service (SaaS) solutions that are designed and built using a microservice architecture, deployed to the Azure cloud, and managed through automation. Microservices, IoT, and Azure offers software developers, architects, and operations engineers' step-by-step directions for building SaaS applications—applications that are available 24x7, work on any device, scale elastically, and are resilient to change--through code, script, exercises, and a working reference implementation. The book provides a working definition of microservices and contrasts this approach with traditional monolithic Layered Architecture. A fictitious, homebiomedical startup is used to demonstrate microservice architecture and automation capabilities for cross-cutting and business services as well as connected device scenarios for Internet of Things (IoT). Several Azure PaaS services are detailed including Storage, SQL Database, DocumentDb, Redis Cache, Cloud Services, Web API's, API Management, IoT Hub, IoT Suite, Event Hub, and Stream Analytics. Finally the book looks to the future and examines Service Fabric to see how microservices are becoming the de facto approach to building reliable software in the cloud. In this book, you’ll learn: What microservices are and why are they’re a compelling architecture pattern for SaaS applications How to design, develop, and deploy microservices using Visual Studio, PowerShell, and Azure Microservice patterns for cross-cutting concerns and business capabilities Microservice patterns for Internet of Things and big data analytics solutions using IoT Hub, Event Hub, and Stream Analytics Techniques for automating microservice provisioning, building, and deployment What Service Fabric is and how it’s the future direction for microservices on Microsoft Azure

This book introduces the concept of software architecture as one of the cornerstones of software in modern cars. Following a historical overview of the evolution of software in modern cars and a discussion of the main challenges driving that evolution, Chapter 2 describes the main architectural styles of automotive software and their use in cars' software. Chapter 3 details this further by presenting two modern architectural styles, i.e. centralized and federated software architectures. In Chapter 4, readers will find a description of the software development processes used to develop software on the car manufacturers' side. Chapter 5 then introduces AUTOSAR - an important standard in automotive software. Chapter 6 goes beyond simple architecture and describes the detailed design process for automotive software using Simulink, helping readers to understand how detailed design links to high-level design.^The new chapter 7 reports on how machine learning is exploited in automotive software e.g. for image recognition and how both on-board and off-board learning are applied. Next, Chapter 8 presents a method for assessing the quality of the architecture - ATAM (Architecture Trade-off Analysis Method) - and provides a sample assessment, while Chapter 9 presents an alternative way of assessing the architecture, namely by using quantitative measures and indicators. Subsequently Chapter 10 dives deeper into one of the specific properties discussed in Chapter 8 - safety - and details an important standard in that area, the ISO/IEC 26262 norm. Lastly, Chapter 11 presents a set of future trends that are currently emerging and have the potential to shape automotive software engineering in the coming years. This book explores the concept of software architecture for modern cars and is intended for both beginning and advanced software designers.^It mainly aims at two different groups of audience - professionals working with automotive software who need to understand concepts related to automotive architectures, and students of software engineering or related fields who need to understand the specifics of automotive software to be able to construct cars or their components. Accordingly, the book also contains a wealth of real-world examples illustrating the concepts discussed and requires no prior background in the automotive domain. Compared to the first edition, besides the two new chapters 3 and 7 there are considerable updates in chapters 5 and 8 especially.

Have you ever wondered how software engineers become software architects? Or how software architects become chief architects? This book discusses 12 of the most important skills every software architect should have and how you can develop and improve these skills. This book is different: It provides real, practical made experience with tangible examples which you can immediately apply, as well as actions which focus on long term improvements. Many insights are backed up by scientific studies or thought leaders. Further reading is provided in form of book references, overviews, templates and videos to dive deeper into your area of interest. It's all about the human: People are creating software. Learn how to make a difference and accelerate your personal performance in an uncertain and increasingly fast-paced world. Unfold your full potential and become a better software architect.

The book covers the best practices and approaches for software architects to follow when developing .NET and C# solutions, along with the most up to date cloud environments and tools to enable effective app development, delivery, and deployment.

Microservices can have a positive impact on your enterprise—just ask Amazon and Netflix—but you can fall into many traps if you don’t approach them in the right way. This practical guide covers the entire microservices landscape, including the principles, technologies, and methodologies of this unique, modular style of system building. You’ll learn about the experiences of organizations around the globe that have successfully adopted microservices. In three parts, this book explains how these services work and what it means to build an application the Microservices Way. You’ll explore a design-based approach to microservice architecture with guidance for implementing various elements. And you’ll get a set of recipes and practices for meeting practical, organizational, and cultural challenges to microservice adoption. Learn how microservices can help you drive business objectives Examine the principles, practices, and culture that define microservice architectures Explore a model for creating complex systems and a design process for building a microservice architecture Learn the fundamental design concepts for individual microservices Delve into the operational elements of a microservices architecture, including containers and service discovery Discover how to handle the challenges of introducing microservice architecture in your organization

Master the Crucial Non -Technical Skills Every Software Architect Needs! Thousands of software professionals have the necessary technical qualifications to become architects, but far fewer have the crucial non-technical skills needed to get hired and succeed in this role. In today's agile environments, these "soft" skills have grown even more crucial to success as an architect. For many developers, however, these skills don't come naturally-and they're rarely addressed in formal training. Now, long-time software architect Dave Hendricksen helps you fill this gap, supercharge your organizational impact, and quickly move to the next level in your career. In 12 Essential Skills for Software Architects, Hendricksen begins by pinpointing the specific relationship, personal, and business skills that successful architects rely upon. Next, he presents proven methods for systematically developing and sharpening every one of these skills, from negotiation and leadership to pragmatism and vision. From start to finish, this book's practical insights can help you get the architect position you want-and thrive once you have it! The soft skills you need... ...and a coherent framework and practical methodology for mastering them! Relationship skills Leadership, politics, gracious behavior, communication, negotiation Personal skills Context switching, transparency, passion Business skills Pragmatism, vision, business knowledge, innovation

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.

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 Introduction. Architectural styles. Case studies. Shared information systems. Architectural design guidance. Formal models and specifications. Linguistics issues. Tools for architectural design. Education of software architects. Architects are often harried because they have no clean, easy decisions: everything is an awful tradeoff between two or more less than perfect alternatives. These are the difficult problems architects face, what this book's authors call "the hard parts." These topics have no best practices, forcing architects to understand various tradeoffs to succeed. This book discusses these hard parts by not only investigating what makes architecture so difficult, but also by providing proven ways to address these problems and make them easier. The book explores topics such as choosing an appropriate architecture, deciding on service granularity, managing workflows and orchestration, managing and decoupling contracts, managing distributed transactions, and optimizing operational characteristics such as scalability, elasticity, and performance. As practicing consultants, the authors focus on questions they commonly hear architects ask and provide techniques that enable them to discover the

tradeoffs necessary to answer these questions.
Architect and design highly scalable, robust, clean, and highly performant applications in Python About This Book Identify design issues and make the necessary adjustments to achieve improved performance Understand practical architectural quality attributes from the perspective of a practicing engineer and architect using Python Gain knowledge of architectural principles and how they can be used to provide accountability and rationale for architectural decisions Who This Book Is For This book is for experienced Python developers who are aspiring to become the architects of enterprise-grade applications or software architects who would like to leverage Python to create effective blueprints of applications. What You Will Learn Build programs with the right architectural attributes Use Enterprise Architectural Patterns to solve scalable problems on the Web Understand design patterns from a Python perspective Optimize the performance testing tools in Python Deploy code in remote environments or on the Cloud using Python Secure architecture applications in Python In Detail This book starts off by explaining how Python fits into an application architecture. As you move along, you will understand the architecturally significant demands and how to determine them. Later, you'll get a complete understanding of the different architectural quality requirements that help an architect to build a product that satisfies business needs, such as maintainability/reusability, testability, scalability, performance, usability, and security. You will use various techniques such as incorporating DevOps, Continuous

Integration, and more to make your application robust. You will understand when and when not to use object orientation in your applications. You will be able to think of the future and design applications that can scale proportionally to the growing business. The focus is on building the business logic based on the business process documentation and which frameworks are to be used when. We also cover some important patterns that are to be taken into account while solving design problems as well as those in relatively new domains such as the Cloud. This book will help you understand the ins and outs of Python so that you can make those critical design decisions that not just live up to but also surpass the expectations of your clients. Style and approach Filled with examples and use cases, this guide takes a no-nonsense approach to help you with everything it takes to become a successful software architect.

This is a practical guide for software developers, and different than other software architecture books. Here's why: It teaches risk-driven architecting. There is no need for meticulous designs when risks are small, nor any excuse for sloppy designs when risks threaten your success. This book describes a way to do just enough architecture. It avoids the one-size-fits-all process tar pit with advice on how to tune your design effort based on the risks you face. It democratizes architecture. This book seeks to make architecture relevant to all software developers. Developers need to understand how to use constraints as guiderails that ensure desired outcomes, and how seemingly small changes can affect a system's properties. It cultivates declarative knowledge. There is a difference between being able to hit a ball and knowing why you are able to hit it, what psychologists refer to as procedural knowledge versus declarative knowledge. This book will make you more aware of what you have been doing and provide names for the concepts. It emphasizes the engineering. This book focuses on the technical parts of software development and what developers do to ensure the system works not job titles or processes. It shows you how to build models and analyze architectures so that you can make principled design tradeoffs. It describes the techniques software designers use to reason about medium to large sized problems and points out where you can learn specialized techniques in more detail. It provides practical advice. Software design decisions influence the architecture and vice versa. The approach in this book embraces drill-down/pop-up behavior by describing models that have various levels of abstraction, from architecture to data structure design.

The Phoenix Project wowed over a half-million readers. Now comes the Wall Street Journal Bestselling The Unicorn Project! “The Unicorn Project is amazing, and I loved it 100 times more than The Phoenix Project…”—FERNANDO CORNAGO, Senior Director Platform Engineering, Adidas “Gene Kim does a masterful job of showing how … the efforts of many create lasting business advantages for all.”—DR. STEVEN SPEAR, author of The High-Velocity Edge, Sr. Lecturer at MIT, and principal of HVE LLC. “The Unicorn Project is so clever, so good, so crazy enlightening!"—CORNELIA DAVIS, Vice President Of Technology at Pivotal Software, Inc., Author of Cloud Native Patterns This highly anticipated follow-up to the bestselling title The Phoenix Project takes another look at Parts Unlimited, this time from the perspective of software development. In The Unicorn Project, we follow Maxine, a senior lead developer and architect, as she is exiled to the Phoenix Project, to the horror of her friends and colleagues, as punishment for contributing to a payroll outage. She tries to survive in what feels like a heartless and uncaring bureaucracy and to work within a system where no one can get anything done without endless committees, paperwork, and approvals. One day, she is approached by a ragtag bunch of misfits who say they want to overthrow the existing order, to liberate developers, to bring joy back to technology work, and to enable the business to win in a time of digital disruption. To her surprise, she finds herself drawn ever further into this movement, eventually becoming one of the leaders of the Rebellion, which puts her in the crosshairs of some familiar and very dangerous enemies. The Age of Software is here, and another mass extinction event looms—this is a story about rebel developers and business leaders working together, racing against time to innovate, survive, and thrive in a time of unprecedented uncertainty...and opportunity. "The Unicorn Project provides insanely useful insights on how to improve your technology business."—DOMINICA DEGRANDIS, author of Making Work Visible and Director of Digital Transformation at Tasktop ——— "My goal in writing The Unicorn Project was to explore and reveal the necessary but invisible structures required to make developers (and all engineers) productive, and reveal the devastating effects of technical debt and complexity. I hope this book can create common ground for technology and business leaders to leave the past behind, and co-create a better future together."—Gene Kim, November 2019

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

Making Sense of Design Effective design is at the heart of everything from software development to engineering to architecture. But what do we really know about the design process? What leads to effective, elegant designs? The Design of Design addresses these questions. These new essays by Fred Brooks contain extraordinary insights for designers in every discipline. Brooks pinpoints constants inherent in all design projects and uncovers processes and patterns likely to lead to excellence. Drawing on conversations with dozens of exceptional designers, as well as his own experiences in several design domains, Brooks observes that bold design decisions lead to better outcomes. The author tracks the evolution of the design process, treats collaborative and distributed design, and illuminates what makes a truly great designer. He examines the nuts and bolts of design processes, including budget constraints of many kinds, aesthetics, design empiricism, and tools, and grounds this discussion in his own real-world examples—case studies ranging from home construction to IBM’s Operating System/360. Throughout, Brooks reveals keys to success that every designer, design project manager, and design researcher should know. The First Complete Guide to DevOps for Software Architects DevOps promises to accelerate the release of new software features and improve monitoring of systems in production, but its crucial implications for software architects and architecture are often ignored. In DevOps: A Software Architect’s Perspective, three leading architects address these issues head-on. The authors review decisions software architects must make in order to achieve DevOps’ goals and clarify how other DevOps participants are likely to impact the architect’s work. They also provide the organizational, technical, and operational context needed to deploy DevOps more efficiently, and review DevOps' impact on each development phase. The authors address cross-cutting concerns that link multiple functions, offering practical insights into compliance, performance, reliability, repeatability, and security. This guide demonstrates the authors' ideas in action with three real-world case studies: datacenter replication for business continuity, management of a continuous deployment pipeline, and migration to a microservice architecture. Comprehensive coverage includes • Why DevOps can require major changes in both system architecture and IT roles • How virtualization and the cloud can enable DevOps practices • Integrating operations and its service lifecycle into DevOps • Designing new systems to work well with DevOps practices • Integrating DevOps with agile methods and TDD • Handling failure detection, upgrade planning, and other key issues • Managing consistency issues arising from DevOps' independent deployment models • Integrating security controls, roles, and audits into DevOps • Preparing a business plan for DevOps adoption, rollout, and measurement

Software architecture—the conceptual glue that holds every phase of a project together for its many stakeholders—is widely recognized as a critical element in modern software development. Practitioners have increasingly discovered that close attention to a software system's architecture pays valuable dividends. Without an architecture that is appropriate for the problem being solved, a project will stumble along or, most likely, fail.

Even with a superb architecture, if that architecture is not well understood or well communicated the project is unlikely to succeed. Documenting Software Architectures, Second Edition, provides the most complete and current guidance, independent of language or notation, on how to capture an architecture in a commonly understandable form. Drawing on their extensive experience, the authors first help you decide what information to document, and then, with guidelines and examples (in various notations, including UML), show you how to express an architecture so that others can successfully build, use, and maintain a system from it. The book features rules for sound documentation, the goals and strategies of documentation, architectural views and styles, documentation for software interfaces and software behavior, and templates for capturing and organizing information to generate a coherent package. New and improved in this second edition: Coverage of architectural styles such as service-oriented architectures, multi-tier architectures, and data models Guidance for documentation in an Agile development environment Deeper treatment of documentation of rationale, reflecting best industrial practices Improved templates, reflecting years of use and feedback, and more documentation layout options A new, comprehensive example (available online), featuring documentation of a Web-based service-oriented system Reference guides for three important architecture documentation languages: UML, AADL, and SySML

An architect's guide to designing, implementing, and integrating DevOps in the enterprise Key Features

Design a DevOps architecture that is aligned with the overall enterprise architecture Design systems that are ready for AIOps and make the move toward NoOps Architect and implement DevSecOps pipelines, securing the DevOps enterprise Book Description Digital transformation is the new paradigm in enterprises, but the big question remains: is the enterprise ready for transformation using native technology embedded in Agile/DevOps? With this book, you'll see how to design, implement, and integrate DevOps in the enterprise architecture while keeping the Ops team on board and remaining resilient. The focus of the book is not to introduce the hundreds of different tools that are available for implementing DevOps, but instead to show you how to create a successful DevOps architecture. This book provides an architectural overview of DevOps, AIOps, and DevSecOps – the three domains that drive and accelerate digital transformation. Complete with step-by-step explanations of essential concepts, practical examples, and self-assessment questions, this DevOps book will help you to successfully integrate DevOps into enterprise architecture. You'll learn what AIOps is and what value it can bring to an enterprise. Lastly, you will learn how to integrate security principles such as zero-trust and industry security frameworks into DevOps with DevSecOps. By the end of this DevOps book, you'll be able to develop robust DevOps architectures, know which toolsets you can use for your DevOps implementation, and have a deeper understanding of next-level DevOps by implementing Site Reliability Engineering (SRE). What you will learn Create DevOps architecture and integrate it with the enterprise architecture Discover how DevOps can add value to the quality of IT delivery Explore strategies to scale DevOps for an enterprise Architect SRE for an enterprise as next-level DevOps Understand AIOps and what value it can bring to an enterprise Create your AIOps architecture and integrate it into DevOps Create your DevSecOps architecture and integrate it with the existing DevOps setup Apply zero-trust principles and industry security frameworks to DevOps Who this book is for This book is for enterprise architects and consultants who want to design DevOps systems for the enterprise. It provides an architectural overview of DevOps, AIOps, and DevSecOps. If you're looking to learn about the implementation of various tools within the DevOps toolchain in detail, this book is not for you.

Right Your Software and Transform Your Career Righting Software presents the proven, structured, and highly engineered approach to software design that renowned architect Juval Löwy has practiced and taught around the world. Although companies of every kind have successfully implemented his original design ideas across hundreds of systems, these insights have never before appeared in print. Based on first principles in software engineering and a comprehensive set of matching tools and techniques, Löwy's methodology integrates system design and project design. First, he describes the primary area where many software architects fail and shows how to decompose a system into smaller building blocks or services, based on volatility. Next, he shows how to flow an effective project design from the system design; how to accurately calculate the project duration, cost, and risk; and how to devise multiple execution options. The method and principles in Righting Software apply regardless of your project and company size, technology, platform, or industry. Löwy starts the reader on a journey that addresses the critical challenges of software development today by righting software systems and projects as well as careers—and possibly the software industry as a whole. Software professionals, architects, project leads, or managers at any stage of their career will benefit greatly from this book, which provides guidance and knowledge that would otherwise take decades and many projects to acquire. Register your book for convenient access to downloads, updates, and/or corrections as they become available. See inside book for details.

Kubernetes is the operating system of the cloud native world, providing a reliable and scalable platform for running containerized workloads. In this friendly, pragmatic book, cloud experts John Arundel and Justin Domingus show you what Kubernetes can do—and what you can do with it. You'll learn all about the Kubernetes ecosystem, and use battle-tested solutions to everyday problems. You'll build, step by step, an example cloud native application and its supporting infrastructure, along with a development environment and continuous deployment pipeline that you can use for your own applications. Understand containers and Kubernetes from first principles; no experience necessary Run your own clusters or choose a managed Kubernetes service from Amazon, Google, and others Use Kubernetes to manage resource usage and the container lifecycle Optimize clusters for cost, performance, resilience, capacity, and scalability Learn the best tools for developing, testing, and deploying your applications Apply the latest industry practices for security, observability, and monitoring Adopt DevOps principles to help make your development teams lean, fast, and effective

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.

A guide to successfully operating in a lean-agile organization for solutions architects and enterprise architects Key Features Develop the right combination of processes and technical excellence to address architectural challenges Explore a range of architectural techniques to modernize legacy systems Discover how to design and continuously improve well-architected sustainable software Book Description Many organizations have embraced Agile methodologies to transform their ability to rapidly respond to constantly changing customer demands. However, in this melee, many enterprises often neglect to invest in architects by presuming architecture is not an intrinsic element of Agile software development. Since the role of an architect is not pre-defined in Agile, many organizations struggle to position architects, often resulting in friction with other roles or a failure to provide a clear learning path for architects to be productive. This book guides architects and organizations through new Agile ways of incrementally developing the architecture for delivering an uninterrupted, continuous flow of values that meets customer needs. You'll explore various aspects of Agile architecture and how it differs from traditional architecture. The book later covers Agile architects' responsibilities and how architects can add significant value by positioning themselves appropriately in the Agile flow of work. Through examples, you'll also learn concepts such as architectural decision backlog,the last responsible moment, value delivery, architecting for change, DevOps, and evolutionary collaboration. By the end of this Agile book, you'll be able to operate as an architect in Agile development initiatives and successfully architect reliable software systems. What you will learn Acquire clarity on the duties of architects in Agile development Understand architectural styles such as domain-driven design and microservices Identify the pitfalls of traditional architecture and learn how to develop solutions Understand the principles of value and data-driven architecture Discover DevOps and continuous delivery from an architect's perspective Adopt Lean-Agile documentation and governance Develop a set of personal and interpersonal qualities Find out how to lead the transformation to achieve organization-wide agility Who this book is for This agile study guide is for architects currently working on agile development projects or aspiring to work on agile software delivery, irrespective of the methodology they are using. You will also find this book useful if you're a senior developer or a budding architect looking to understand an agile architect's role by embracing agile architecture strategies and a lean-agile mindset. To understand the concepts covered in this book easily, you need to have prior knowledge of basic agile development practices.

In Team Topologies DevOps consultants Matthew Skelton and Manuel Pais share secrets of successful team patterns and interactions to help readers choose and evolve the right team patterns for their organization, making sure to keep the software healthy and optimize value streams. Team Topologies will help readers discover: • Team patterns used by successful organizations. • Common team patterns to avoid with modern software systems. • When and why to use different team patterns • How to evolve teams effectively. • How to split software and align to teams.

Virtualization, cloud, containers, server automation, and software-defined networking are meant to simplify IT operations. But many organizations adopting these technologies have found that it only leads to a faster-growing sprawl of unmanageable systems. This is where infrastructure as code can help. With this practical guide, author Kief Morris of ThoughtWorks shows you how to effectively use principles, practices, and patterns pioneered through the DevOps movement to manage cloud age infrastructure. Ideal for system administrators, infrastructure engineers, team leads, and architects, this book demonstrates various tools, techniques, and patterns you can use to implement infrastructure as code. In three parts, you'll learn about the platforms and tooling involved in creating and configuring infrastructure elements, patterns for using these tools, and practices for making infrastructure as code work in your environment. Examine the pitfalls that organizations fall into when adopting the new generation of infrastructure technologies Understand the capabilities and service models of dynamic infrastructure platforms Learn about tools that provide, provision, and configure core infrastructure resources Explore services and tools for managing a dynamic infrastructure Learn specific patterns and practices for provisioning servers, building server templates, and updating running servers

In Continuous Architecture in Practice, three leading software architecture experts update the discipline's classic practices for today's environments, software development contexts, and applications. Coverage includes: Discover what's changed, and how the architect's role must change Reflect today's quality attributes in evolvable architectures Understand team-based software architecture, and architecture as a "flow of decisions" Architect for security, including continuous threat modeling and mitigation Explore architectural opportunities to improve performance in continuous delivery environments Architect for scalability, avoid common scalability pitfalls, and scale microservices and serverless environments Improve resilience and reliability in the face of inevitable failures Architect data for NoSQL, big data, and analytics Use architecture to promote innovation: case studies in AI/ML, chatbots, and blockchain

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.

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.

DevOpsA Software Architect's PerspectiveAddison-Wesley Professional

Learn to design, implement, measure, and improve DevOps programs that are tailored to your organization. This concise guide assists leaders who are accountable for the rapid development of high-quality software applications. In DevOps for Digital Leaders, deep collective experience on both sides of the dev–ops divide informs the global thought leadership and penetrating insights of the authors, all three of whom are cross-portfolio DevOps leaders at CA Technologies. Aruna Ravichandran, Kieran Taylor, and Peter Waterhouse analyze the organizational benefits, costs, freedoms, and constraints of DevOps. They chart the coordinated strategy of organizational change, metrics, lean thinking, and investment that an enterprise must undertake to realize the full potential of DevOps and reach the sweet spot where accelerating code deployments drive increasing customer satisfaction, revenue, and profitability. Digital leaders are charged to bridge the dev–ops disconnect if their organizations are to survive and flourish in a business world increasingly differentiated by the degree to which dynamic application software development harmonizes with operational resilience and reliability. This short book applies the DevOps perspective to the competitive challenge, faced by every high-performance IT organization today, of integrating and automating open source, cloud, and enterprise tools, processes, and techniques across the software development life cycle from requirements to release. What You Will Learn: Remove dependencies and constraints so that parallel practices can accelerate the development of defect-free software Automate continuous delivery across the software life cycle to eliminate release bottlenecks, manual labor waste, and technical debt accumulation Generate virtualized production-style testing of applications through real-time behavioral analytics Adopt agile practices so operations teams can support developer productivity with automated feedback, streamline infrastructure monitoring, spot and resolve operations issues before they impact production, and improve customer experience Identify the DevOps metrics appropriate to your organization and integrate DevOps with your existing best practices and investment Who This Book Is For: IT leaders in large companies and government agencies who have any level of responsibility for the rapid development of high-quality software applications. The secondary readership is members of development and operations teams, security professionals, and service managers. Software Systems Architecture is a practitioner-oriented guide to designing and implementing effective architectures for information systems. It is both a readily accessible introduction to software architecture and an invaluable handbook of well-established best practices. It shows why the role of the architect is central to any successful information-systems development project, and, by presenting a set of architectural viewpoints and perspectives, provides specific direction for improving your own and your organization's approach to software systems architecture. With this book you will learn how to Design an architecture that reflects and balances the different needs of its stakeholders Communicate the architecture to stakeholders and demonstrate that it has met their requirements Focus on architecturally significant aspects of design, including frequently overlooked areas such as performance, resilience, and location Use scenarios and patterns to drive the creation and validation of your architecture Document your architecture as a set of related views Use perspectives to ensure that your architecture exhibits important qualities such as performance, scalability, and security The architectural viewpoints and perspectives presented in the book also provide a valuable long-term reference source for new and experienced architects alike. Whether you are an aspiring or practicing software architect, you will find yourself referring repeatedly to the practical advice in this book throughout the lifecycle of your projects. A supporting Web site containing further information can be found at www.viewpoints-and-perspectives.info

This book will show you how to create robust, scalable, highly available and fault-tolerant solutions by learning different aspects of Solution architecture and next-generation architecture design in the Cloud environment.

DevOps promises to accelerate the release of new software features and improve monitoring of systems in production, but its crucial implications for software architects and architecture are often ignored. In DevOps: A Software Architect's Perspective, three leading architects address these issues head-on. The authors review decisions software architects must make in order to achieve DevOps' goals and clarify how other DevOps participants are likely to impact the architect's work. They also provide the organizational, technical, and operational context needed to deploy DevOps more efficiently, and review DevOps' impact on each development phase. The authors also address cross-cutting concerns that link multiple functions, offering practical insights into compliance, performance, reliability, repeatability, and security. This guide demonstrates the authors' ideas in action with three real-world case studies: datacenter maintenance for business continuity, management of a continuous deployment pipeline, and migration to a microservice architecture. Comprehensive coverage includes • Why DevOps can require major changes in both system architecture and IT roles • How virtualization and the cloud can enable DevOps practices • Integrating operations and its service lifecycle into DevOps • Designing new systems to work well with DevOps practices • Overcoming cultural and communication differences between Dev and Ops • Integrating DevOps with agile methods and TDD • Handling failure detection, upgrade planning, and other key issues • Managing consistency issues arising from DevOps' independent deployment models • Integrating security controls, roles, and audits into DevOps • Preparing a business plan for DevOps adoption, rollout, and measurement

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.

This open access book includes contributions by leading researchers and industry thought leaders on various topics related to the essence of software engineering and their application in industrial projects. It offers a broad overview of research findings dealing with current practical software engineering issues and also pointers to potential future developments. Celebrating the 20th anniversary of adesso AG, adesso gathered some of the pioneers of software engineering including Manfred Broy, Ivar Jacobson and Carlo Ghezzi at a special symposium, where they presented their thoughts about latest software engineering research and which are part of this book. This way it offers readers a concise overview of the essence of software engineering, providing valuable insights into the latest methodological research findings and adesso’s experience applying these results in real-world projects.