

## Software Architect (Behind The Scenes With Coders)

Information technology has brought about a radical change in architectural design. The sketches and plans of yesterday have been transformed by CAD. In this book the authors cast a glance behind the scenes to provide a systematic overview of the tools and technical processes which are now an integral part of today's design methods. The most important digital tools are presented, the principal steps are analysed, and the essential concepts are explained. The theoretical information is vividly illustrated by a selection of examples from the world of architecture. A concise and accessible introduction to electronic designing, this book makes the subject easily comprehensible to all who are new to the field, and for those who already involved in digital designing it is a useful recapitulation and orientation.

This book constitutes the proceedings of the 8th European Conference on Software Architecture, ECSA 2014, held in Vienna, Austria, in August 2014. The 16 full papers and 18 short papers presented in this volume were carefully reviewed and selected from 91 submissions. They are organized in topical sections named: architecture decisions and knowledge; architecture patterns and anti-patterns; reference architectures and metamodels; architecture description languages; enterprise architecture, SOA and cloud computing; components and connectors; quality attributes; and architecture analysis and verification.

As conventional hydrocarbon resources dwindle, and environmentally-driven markets start to form and mature, investments are expected to shift into the development of novel emerging subsurface process technologies. While these processes are characterized by a high commercial potential, they are also typically associated with high technical risk. The time-to-market along comparable development pipelines, such as for Enhanced Oil Recovery (EOR) methods in the Oil and Gas sector, is on the order of tens of years. It is anticipated that in the near future, there will be much value in developing simulation tools that can shorten time-to-market cycles, making investment shifts more attractive. There are two forces however that may debilitate us from delivering simulation as a scientific discovery tool. The first force is the growing nonlinearity of the problem base. The second force is the flip-side of a double edged sword; a rapidly evolving computer architecture scene. The first part of this work concerns the formulation and linearization of nonlinear simultaneous equations; the archetypal inflexible component of all large scale simulators. The proposed solution is an algorithmic framework and library of data-types called the Automatically Differentiable Expression Templates Library (ADETL). The ADETL provides generic representations of variables and discretized expressions on a simulation grid, and the data-types provide algorithms employed behind the scenes to automatically compute the sparse analytical Jacobian. Using the library, large-scale simulators can be developed rapidly by simply writing the residual equations, and without any hand differentiation, hand crafted performance tuning loops, or any other low-level constructs. A key challenge that is addressed is in enabling this level of abstraction and programming ease while making it easy to develop code that runs fast. Faster than any of several existing automatic differentiation packages, faster than any purely Object Oriented implementation, and at least in the order of the execution speed of code delivered by a development team with hand-optimized residuals, analytical derivatives, and Jacobian assembly routines. A second challenge is in providing a generic multi-layered software framework that incorporates plug-in low-level constructs tuned to emerging architectures. The inception of the ADETL spurred an effort to develop the new generation AD-GPRS simulator, which we use to demonstrate the powers of the ADETL. We conclude with a thought towards a future where simulators can write themselves. The second part of this work develops nonlinear methods that can exploit the nature of the underlying physics to deal with the current and upcoming challenges in physical nonlinearity. The Fully Implicit Method offers unconditional stability of the discrete approximations. This stability comes at the expense of transferring the inherent physical stiffness onto the coupled nonlinear residual equations that are solved at each timestep. Current reservoir simulators apply safe-guarded variants of Newton's method that can neither guarantee convergence, nor provide estimates of the relation between convergence rate and timestep size. In practice, timestep chops become necessary, and they are guided heuristically. With growing complexity, convergence difficulties can lead to substantial losses in computational effort and prohibitively small timesteps. We establish an alternate class of nonlinear iteration that converges and that associates a timestep to each iteration. Moreover, the linear solution process within each iteration is performed locally. Several challenging examples are presented, and

the results demonstrate the robustness and computational efficiency of the proposed class of methods. We conclude with thoughts to unify timestepping and iterative nonlinear methods.

Build robust and scalable Java applications by learning how to implement every aspect of software architecture  
Key Features  
Understand the fundamentals of software architecture and build production-grade applications in Java  
Make smart architectural decisions with comprehensive coverage of various architectural approaches from SOA to microservices  
Gain an in-depth understanding of deployment considerations with cloud and CI/CD pipelines  
Book Description  
Well-written software architecture is the core of an efficient and scalable enterprise application. Java, the most widespread technology in current enterprises, provides complete toolkits to support the implementation of a well-designed architecture. This book starts with the fundamentals of architecture and takes you through the basic components of application architecture. You'll cover the different types of software architectural patterns and application integration patterns and learn about their most widespread implementation in Java. You'll then explore cloud-native architectures and best practices for enhancing existing applications to better suit a cloud-enabled world. Later, the book highlights some cross-cutting concerns and the importance of monitoring and tracing for planning the evolution of the software, foreseeing predictable maintenance, and troubleshooting. The book concludes with an analysis of the current status of software architectures in Java programming and offers insights into transforming your architecture to reduce technical debt. By the end of this software architecture book, you'll have acquired some of the most valuable and in-demand software architect skills to progress in your career. What you will learn  
Understand the importance of requirements engineering, including functional versus non-functional requirements  
Explore design techniques such as domain-driven design, test-driven development (TDD), and behavior-driven development  
Discover the mantras of selecting the right architectural patterns for modern applications  
Explore different integration patterns  
Enhance existing applications with essential cloud-native patterns and recommended practices  
Address cross-cutting considerations in enterprise applications regardless of architectural choices and application type  
Who this book is for  
This book is for Java software engineers who want to become software architects and learn everything a modern software architect needs to know. The book is also for software architects, technical leaders, vice presidents of software engineering, and CTOs looking to extend their knowledge and stay up to date with the latest developments in the field of software architecture.

Develop software solutions using microservices, DevOps, EF Core, and design patterns for Azure

Knowledge Building & Knowledge Sharing 1995

A Risk-Driven Approach

8th European Conference, ECSA 2014, Vienna, Austria, August 25-29, 2014, Proceedings

Software Architecture Patterns for Serverless Systems

New Perspectives on Computer Concepts 2014: Comprehensive

Design scalable and high-performance enterprise applications using the latest features of C# 9 and .NET 5  
Key Features  
Gain fundamental and comprehensive software architecture knowledge and the skillset to create fully modular apps  
Design high-performance software systems using the latest features of .NET 5 and C# 9  
Solve scalability problems in web apps using enterprise architecture patterns  
Book Description  
Software architecture is the practice of implementing structures and systems that streamline the software development process and improve the quality of an app. This fully revised and expanded second edition, featuring the latest features of .NET 5 and C# 9, enables you to acquire the key skills, knowledge, and best practices required to become an effective software architect. This second edition features additional explanation of the principles of Software architecture, including new chapters on Azure Service Fabric, Kubernetes, and Blazor. It also includes more discussion on security, microservices, and DevOps, including GitHub deployments for the software development cycle. You will begin by understanding how to transform user requirements into architectural needs and exploring the differences between functional and non-functional requirements. Next, you will explore how to carefully choose a cloud solution for your infrastructure, along with the factors that will help you manage your app in a cloud-based environment. Finally, you will discover software design patterns and various software approaches that will allow you to solve common problems faced during development. By the end of this book, you will be able to build and deliver highly scalable enterprise-ready apps that meet your organization's business requirements. What you will learn  
Use different techniques to overcome real-world architectural challenges and solve design consideration issues  
Apply architectural approaches such as layered architecture, service-oriented architecture (SOA), and microservices  
Leverage tools such as containers, Docker, Kubernetes, and Blazor to manage microservices effectively  
Get up to speed with Azure tools and features for delivering global solutions  
Program and maintain Azure Functions using C# 9 and its latest features  
Understand when it is best to use test-driven development (TDD) as an approach for software development  
Write automated functional test cases  
Get the best of DevOps principles to enable CI/CD environments  
Who this book is

for This book is for engineers and senior software developers aspiring to become architects or looking to build enterprise applications with the .NET Stack. Basic familiarity with C# and .NET is required to get the most out of this book.

Technology impacts every aspect of life, and choices are endless. You need to know how to evaluate devices, choose apps, maintain a compelling online reputation and lock down digital security. Cengage's NEW PERSPECTIVES COMPUTER CONCEPTS INTRODUCTORY 21st Edition goes beyond the intuitive how-to of apps and social media to delve into the broad concepts that are guiding current technologies, such as self-driving cars, virtual reality, file sharing torrents, encrypted communications, photo forensics and the Internet of Things. Detailed illustrations and interactive features help you quickly understand technical topics. Completely up to date, this edition offers an insightful overview of what every learner should know about using technology to complete your education, launch a successful career and engage in issues that shape today's world. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

This book constitutes the refereed proceedings of the 8th European Workshop on Software Process Technology, EWSPT 2001, held in Witten, Germany, in June 2001. The 18 revised full papers presented were carefully reviewed and selected from 31 submissions. Among the areas addressed are process evolution, experiences, mobility and distribution, UML process patterns, and process improvement.

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.

Beautiful Architecture

The Art and Science of Analyzing Software Data

Process-Centric Architecture for Enterprise Software Systems

New Perspectives on Computer Concepts 2016, Introductory

Architecting for innovation with events, autonomous services, and micro frontends

Hands-On Software Architecture with Java

**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](http://www.viewpoints-and-perspectives.info).**

**Software architects are in charge of designing and developing the software programs that computers need to operate. In this book, readers will learn more about what software architects do, including where they work, what information they should know, and what skills they should have. STEM concepts addressed in the Next Generation Science Standards are discussed throughout the text. The text support elementary curriculum and addresses computational thinking. A**

***glossary helps readers gain an understanding of new or complicated computer terminology.***

***Helping you understand the technological foundations for a wide range of digital devices, New Perspectives Computer Concepts Comprehensive, 21st edition, presents what every learner should know about using technology to complete your education, launch a successful career and engage in issues that shape today's world. The book's proven learning path is structured with today's busy reader in mind. Leading tech author June Parsons combines the latest on emerging technology with detailed illustrations and interactive activities that help you quickly understand technical topics. This edition provides updated information on current operating systems, digital rights management, the deep web and dark web, blogs, videoconferencing trends, the pandemic's impact on tech jobs, work-at-home, remote learning and more. In addition, a unique module provides a hands-on introduction to programming. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.***

***Master The Crucial Technical Skills Every Software Architect Needs! To succeed as a software architect, you must master both technical skills and soft skills. Dave Hendricksen illuminated the soft skills in his highly-regarded 12 Essential Skills for Software Architects. Now, in 12 More Essential Skills for Software Architects he turns to the technical side. Drawing on his decades of experience, Hendricksen organizes technical skills into three areas. PROJECT SKILLS: driving projects from ideation through delivery TECHNOLOGY SKILLS: building, buying, and/or leveraging the right technologies VISIONARY SKILLS: realizing an architectural vision that improves long-term competitiveness He helps you develop and sharpen these key technical skills: from conceptualizing solutions to developing platforms and governance, and from selecting technology innovations to infusing architectures with an entrepreneurial spirit. This guide reveals the technical skills you need and provides a coherent framework and practical methodology for mastering them. Taken together, Hendricksen's two books offer the most complete, practical pathway to excellence in software architecture. They'll guide you through every step of your architecture career—from getting the right position to thriving once you have it. Essential Architect Skills Visionary Skills Entrepreneurial Execution Technology Innovation Strategic Roadmapping Technology Skills Governance Platform Development Know-how Architectural Perspective Project Skills Estimation Partnership Discovery Management Conceptualization Dave Hendricksen is a big data architect for Thomson Reuters, where he works closely with the firm's new product development teams to create innovative legal products for large-scale online platforms such as Westlaw.com. Hendricksen presented "Designing and Building Large-Scale Systems in an Agile World" at Carnegie Mellon University's influential Software Engineering Institute.***

***Software Architecture***

***Software Architecture: The Hard Parts***

***Just Enough Software Architecture***

***IBM Reference Architecture for High Performance Data and AI in Healthcare and Life Sciences***

***Graph Transformation for Software Engineers***

***A Practical Guide to the Models and Methods of Usage-Centered Design***

*Gain the knowledge and skills necessary to improve your embedded software and benefit from author Jacob Beningo's more than 15 years developing reusable and portable software for resource-constrained microcontroller-based systems. You will explore APIs, HALs, and driver development among other topics to acquire a solid foundation for improving your own software. Reusable Firmware Development: A Practical Approach to APIs, HALs and Drivers not only explains critical concepts, but also provides a plethora of examples, exercises, and case studies on how to use and implement the concepts. What You'll Learn Develop portable firmware using the C programming language Discover APIs and HALs, explore their differences, and see why they are important to developers of resource-constrained software Master microcontroller driver development concepts, strategies, and examples Write drivers that are reusable across multiple MCU families and vendors Improve the way software documented Design APIs and HALs for microcontroller-based systems Who This Book Is For Those with some prior experience with embedded programming.*

*Readers gain a full understanding of today's digital world with the cohesive framework and logical organization found only in NEW PERSPECTIVES ON COMPUTER CONCEPTS 2016, ENHANCED, COMPREHENSIVE. This dynamic book provides the latest updates on emerging technology with engaging learning features, informative visuals and hands-on activities proven to increase learning effectiveness. An insightful introduction highlights today's digital evolution, while coverage of social media and online security examines concepts behind today's technology challenges and trends. Readers explore the principles underlying the wide scope of digital devices in use today with the book's unique focus on the connectivity that pervades modern life. This Enhanced Edition includes a new hands-on programming chapter that lets even readers with no prior coding experience learn to program with instant success using Python™. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.*

*This book is an introduction to graph transformation as a foundation to model-based software engineering at the level of both individual systems and domain-specific modelling languages. The first part of the book presents the fundamentals in a precise, yet largely informal way. Besides serving as prerequisite for describing the applications in the second part, it also provides a comprehensive and systematic survey of the concepts, notations and techniques of graph transformation. The second part presents and discusses a range of applications to both model-based software engineering and domain-specific language engineering. The variety of these applications demonstrates how broadly graphs and graph transformations can be used to model, analyse and implement complex software systems and languages. This is the first textbook that explains the most commonly used concepts, notations, techniques and applications of graph transformation without focusing on one particular mathematical representation or implementation approach.*

*Emphasising the research and engineering methodologies used, it will be a valuable resource for graduate students, practitioners and researchers in software engineering, foundations of programming and formal methods.*

*Getting Architecture Just Right: Detailed Practical Guidance for Architecting Any Real-World IT Project To build effective architectures, software architects must tread a fine line between precision and ambiguity (a.k.a. big animal pictures). This is difficult but crucial: Failure to achieve this balance often leads directly to poor systems design and implementation. Now, pioneering IBM Distinguished Engineer and Chief Technology Officer Tilak Mitra offers the first complete guide to developing end-to-end solution architectures that are "just enough"--identifying and capturing the most important artifacts, without over-engineering or excessive documentation, and providing a practical approach to consistent and repeated success in defining software architectures. Practical Software Architecture provides detailed prescriptive and pragmatic guidance for architecting any real-world IT project, regardless of system, methodology, or environment. Mitra specifically identifies the artifacts that require emphasis and shows how to communicate evolving solutions with stakeholders, bridging the gap between architecture and implementation.*

*Avant-garde Techniques of Contemporary Design*

*New Perspectives Computer Concepts 2016 Enhanced, Comprehensive*

*Architecting software solutions using microservices, DevOps, and design patterns for Azure, 2nd Edition*

*CCSP (ISC)2 Certified Cloud Security Professional Official Study Guide*

*Software Architecture for Big Data and the Cloud*

*New Perspectives Computer Concepts Comprehensive*

Go beyond computing basics with the award-winning NEW PERSPECTIVES ON COMPUTER CONCEPTS. Designed to get you up-to-speed on essential computer literacy skills, this market leading text goes deeper, providing technical and practical information relevant to everyday life. NEW PERSPECTIVES ON COMPUTER CONCEPTS 2014 incorporates significant technology trends that affect computing and everyday life; such as concerns for data security, personal privacy, online safety, controversy over digital rights management, interest in open source software and portable applications, and more. In addition, coverage of Microsoft Windows 8 and Office 2013 will introduce you to the exciting new features of Microsoft's next generation of software. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

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 trap 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 only official study guide for the new CCSP exam CCSP (ISC)2 Certified Cloud Security Professional Official Study Guide is your ultimate resource for the CCSP exam. As the only official study guide reviewed and endorsed by (ISC)2, this guide helps you prepare faster and smarter with the Sybex study tools that include pre-test assessments that show you what you know, and areas you need further review. Objective maps, exercises, and chapter review questions help you gauge your progress along the way, and the Sybex interactive online learning environment includes access to a PDF glossary, hundreds of flashcards, and two complete practice exams. Covering all CCSP domains, this book walks you through Architectural Concepts and Design Requirements, Cloud Data Security, Cloud Platform and Infrastructure Security, Cloud Application Security, Operations, and Legal and Compliance with real-world scenarios to help you apply your skills along the way. The CCSP is the latest credential from (ISC)2 and the Cloud Security Alliance, designed to show employers that you have what it takes to keep their organization safe in the cloud. Learn the skills you need to be confident on exam day and beyond. Review 100% of all CCSP exam objectives Practice applying essential concepts and skills Access the industry-leading online study tool set Test your knowledge with bonus practice exams and more As organizations become increasingly reliant on cloud-based IT, the threat to data security looms larger. Employers are seeking qualified professionals with a proven cloud security skillset, and the CCSP credential brings your resume to the top of the pile. CCSP (ISC)2 Certified Cloud Security Professional Official Study Guide gives you the tools and information you need to earn that certification, and apply your skills in a real-world setting.

In the early days of artificial intelligence it was widely believed that powerful computers would, in the future, enable mankind to solve many real-world problems through the use of very general inference procedures and very little domain-specific knowledge. With the benefit of hindsight, this view can now be called quite naive. The field of expert systems, which developed during the early 1970s, embraced the paradigm that Knowledge is Power - even very fast computers require very large amounts of very specific knowledge to solve non-trivial problems. Thus, the field of large knowledge bases has emerged.

Software Architecture with C# 9 and .NET 5

Software Performance and Scalability

Practical Software Architecture

Next Generation IT Architecture:

## Software Architect

A professional's guide to solving complex problems while designing modern software Key Features Learn best practices for designing enterprise-grade software systems from a seasoned CTO Deeper your understanding of system reliability, maintainability, and scalability Elevate your skills to a professional level 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 showing you how to implement and operate anti-fragile systems. First, you'll divide up a system and define boundaries so that your teams can work autonomously and accelerate innovation. You'll cover low-level event and data patterns that support the entire architecture, while getting up and running with the different autonomous service design patterns. Next, the book will focus on best practices for security, reliability, testability, observability, and performance. You'll combine all that you've learned and build upon that foundation, exploring the methodologies of continuous experimentation, deployment, and delivery before delving into 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 who want to learn more about different software design patterns and best practices. This isn't a beginner's manual - you'll need an intermediate level of programming proficiency and software design to get started. You'll get the most out of this software design book if you already know the basics of the cloud, but it isn't a prerequisite.

In today's world where technology impacts every aspect of life, you need to know how to evaluate devices, choose apps, maintain a professional online reputation, and ensure digital security. NEW PERSPECTIVES ON COMPUTER CONCEPTS 2018, COMPREHENSIVE offers the insights to help. This book goes beyond the intuitive how-to of apps and social media to delve into broad concepts that are guiding current technologies such as self-driving cars, virtual reality, file sharing torrents, encrypted communications, photo forensics, and the Internet of Things. Numerous illustrations and interactive features make mastering technical topics a breeze, while the book's proven learning path is structured with today's busy reader in mind. This edition offers an insightful overview of what today's readers must know about using technology to complete an education, secure a successful career, and engage in issues that shape today's world. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

In the quest for quality, software developers have long focused on improving the internal architecture of their products. Larry L. Constantine--who originally created structured design to effect such improvement--now joins with well-known consultant Lucy A. D. Lockwood to turn the focus of software development to the external architecture. In this book, they present the models and methods of a revolutionary approach to software that will help programmers deliver more usable software--software that will enable users to accomplish their tasks with greater ease and efficiency. Recognizing usability as the key to successful software, Constantine and Lockwood provide concrete tools and techniques that programmers can employ to meet that end. Much more than just another set of rules for good user-interface design, this book guides readers through a systematic software development process. This process, called usage-centered design, weaves together two major threads in software development methods: use cases (also used with UML) and essential modeling. With numerous examples and case studies of both conventional and specialized software applications, the authors illustrate what has been shown in practice to work and what has proved to be of greatest practical value. Highlights Presents a streamlined process for developing highly usable software Describes practical methods and models successfully implemented in industry Complements modern development practices, including the Unified Process and other object-oriented software engineering approaches

What are the ingredients of robust, elegant, flexible, and maintainable software architecture? Beautiful Architecture answers this question through a collection of intriguing essays from more than a dozen of today's leading software designers and architects. In each essay, contributors present a notable software architecture, and analyze what makes it innovative and ideal for its purpose. Some of the engineers in this book reveal how they developed a specific project, including decisions they faced and tradeoffs they made. Others take a step back to investigate how certain architectural aspects have influenced computing as a whole. With this book, you'll discover: How Facebook's

architecture is the basis for a data-centric application ecosystem The effect of Xen's well-designed architecture on the way operating systems evolve How community processes within the KDE project help software architectures evolve from rough sketches to beautiful systems How creeping featurism has helped GNU Emacs gain unanticipated functionality The magic behind the Jikes RVM self-optimizable, self-hosting runtime Design choices and building blocks that made Tandem the choice platform in high-availability environments for over two decades Differences and similarities between object-oriented and functional architectural views How architectures can affect the software's evolution and the developers' engagement Go behind the scenes to learn what it takes to design elegant software architecture, and how it can shape the way you approach your own projects, with Beautiful Architecture.

Implementing edge and IoT systems from sensors to clouds with communication systems, analytics, and security, 2nd Edition

New Perspectives Concepts Introductory

Design and architect highly scalable and robust applications using Go

Behind the Scenes

8th European Workshop, EWSPT 2001 Witten, Germany, June 19-21, 2001 Proceedings

Moving from System Context to Deployment

The Art and Science of Analyzing Software Data provides valuable information on analysis techniques often used to derive insight from software data. This book shares best practices in the field generated by leading data scientists, collected from their experience training software engineering students and practitioners to master data science. The book covers topics such as the analysis of security data, code reviews, app stores, log files, and user telemetry, among others. It covers a wide variety of techniques such as co-change analysis, text analysis, topic analysis, and concept analysis, as well as advanced topics such as release planning and generation of source code comments. It includes stories from the trenches from expert data scientists illustrating how to apply data analysis in industry and open source, present results to stakeholders, and drive decisions. Presents best practices, hints, and tips to analyze data and apply tools in data science projects Presents research methods and case studies that have emerged over the past few years to further understanding of software data Shares stories from the trenches of successful data science initiatives in industry

This IBM® Redpaper publication provides an update to the original description of IBM Reference Architecture for Genomics. This paper expands the reference architecture to cover all of the major vertical areas of healthcare and life sciences industries, such as genomics, imaging, and clinical and translational research. The architecture was renamed IBM Reference Architecture for High Performance Data and AI in Healthcare and Life Sciences to reflect the fact that it incorporates key building blocks for high-performance computing (HPC) and software-defined storage, and that it supports an expanding infrastructure of leading industry partners, platforms, and frameworks. The reference architecture defines a highly flexible, scalable, and cost-effective platform for accessing, managing, storing, sharing, integrating, and analyzing big data, which can be deployed on-premises, in the cloud, or as a hybrid of the two. IT organizations can use the reference architecture as a high-level guide for overcoming data management challenges and processing bottlenecks that are frequently encountered in personalized healthcare initiatives, and in compute-intensive and data-intensive biomedical workloads. This reference architecture also provides a framework and context for modern healthcare and life sciences institutions to adopt cutting-edge technologies, such as cognitive life sciences solutions, machine learning and deep learning, Spark for analytics, and cloud computing. To illustrate these points, this paper includes case studies describing how clients and IBM Business Partners alike used the reference architecture in the deployments of demanding infrastructures for precision medicine. This publication targets technical professionals (consultants, technical support staff, IT Architects, and IT Specialists) who are responsible for providing life sciences solutions and support.

An essential guide to understanding the Cisco IOS architecture In-depth coverage of Cisco's IOS Software architecture provides crucial information to: Prevent network problems and optimize performance through more efficient design and configuration Isolate and resolve network problems more quickly and easily Apply the appropriate packet switching method, such as process switching, fast switching, optimum switching, or Cisco Express Forwarding (CEF) Understand the hardware architecture, packet buffering, and packet switching processes for shared memory routers (Cisco 1600, 2500, 3600, 4000, 4500, and 4700 series) Understand the hardware architecture, packet buffering, and packet switching processes for the Cisco 7200 series routers Understand the hardware architecture, packet buffering, and packet switching processes for the Cisco 7500 series routers Understand the hardware architecture, packet buffering, and packet switching processes for the Cisco GSR 12000 series routers Further your knowledge of how IOS Software implements Quality of Service (QoS) Inside Cisco IOS Software Architecture offers crucial and hard-to-find information on Cisco's Internetwork Operating System (IOS) Software. IOS Software provides the means by which networking professionals configure and manage Cisco networking devices. Beyond understanding the Cisco IOS command set, comprehending what happens inside Cisco routers will help you as a network designer or engineer to perform your job more effectively. By understanding the internal operations of IOS Software, you will be able to take architectural considerations into account when designing networks and isolate problems more easily when troubleshooting networks. Inside Cisco IOS Software Architecture provides essential information on the internal aspects of IOS Software at this level, and it is an invaluable resource for better understanding the intricacies of IOS Software and how it affects your network. Inside Cisco IOS Software Architecture begins with an overview of operating system concepts and the IOS Software infrastructure, including processes, memory management, CPU scheduling, packet buffers, and device drivers, as well as a discussion of packet switching architecture with detailed coverage of the various platform-independent switching methods, including process switching, fast switching, optimum switching, and Cisco Express Forwarding (CEF). The book then delves into the intricate details of the design and operation of platform-specific features, including the 1600, 2500, 4x00, 3600, 7200, 7500, and GSR Cisco routers. Finally, an overview of IOS Quality of Service (QoS) is provided, including descriptions of several QoS methods, such as priority queuing, custom queuing, weighted fair queuing, and modified

deficit round robin.

Take your students beyond the basics with the award-winning **NEW PERSPECTIVES ON COMPUTER CONCEPTS**. Designed to get all students up-to-speed on essential computer literacy skills, this market leading text goes deeper, providing students with the technical and practical information they need for academic and career success. **NEW PERSPECTIVES ON COMPUTER CONCEPTS 2016** incorporates significant technology trends that affect computing and everyday life; such as concerns for data security, personal privacy, online safety, controversy over digital rights management, interest in open source software and portable applications, and more. In addition, coverage of Microsoft Windows 8 and Office 2013 will introduce your students to the exciting new features of Microsoft's next generation of software. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Towards Very Large Knowledge Bases

Software Systems Architecture

With Applications to Model-Based Development and Domain-Specific Language Engineering

A Practical Approach to APIs, HALs and Drivers

Software Architecture with Python

Inside Cisco IOS Software Architecture

Learn to design, implement, and secure your IoT infrastructure. Revised and expanded for edge computing. Key Features Build a complete IoT system that's the best fit for your organization Learn about different concepts, tech, and trade-offs in the IoT architectural stack Understand the theory and implementation of each element that comprises IoT design Book Description Industries are embracing IoT technologies to improve operational expenses, product life, and people's well-being. An architectural guide is needed if you want to traverse the spectrum of technologies needed to build a successful IoT system, whether that's a single device or millions of IoT devices. IoT and Edge Computing for Architects, Second Edition encompasses the entire spectrum of IoT solutions, from IoT sensors to the cloud. It examines modern sensor systems, focusing on their power and functionality. It also looks at communication theory, paying close attention to near-range PAN, including the new Bluetooth® 5.0 specification and mesh networks. Then, the book explores IP-based communication in LAN and WAN, including 802.11ah, 5G LTE cellular, Sigfox, and LoRaWAN. It also explains edge computing, routing and gateways, and their role in fog computing, as well as the messaging protocols of MQTT 5.0 and CoAP. With the data now in internet form, you'll get an understanding of cloud and fog architectures, including the OpenFog standards. The book wraps up the analytics portion with the application of statistical analysis, complex event processing, and deep learning models. The book then concludes by providing a holistic view of IoT security, cryptography, and shell security in addition to software-defined perimeters and blockchains. What you will learn Understand the role and scope of architecting a successful IoT deployment Scan the landscape of IoT technologies, from sensors to the cloud and more See the trade-offs in choices of protocols and communications in IoT deployments Become familiar with the terminology needed to work in the IoT space Broaden your skills in the multiple engineering domains necessary for the IoT architect Implement best practices to ensure reliability, scalability, and security in your IoT infrastructure Who this book is for This book is for architects, system designers, technologists, and technology managers who want to understand the IoT ecosphere, technologies, and trade-offs, and develop a 50,000-foot view of IoT architecture. An understanding of the architectural side of IoT is necessary.

Praise from the Reviewers: "The practicality of the subject in a real-world situation distinguishes this book from others available on the market." —Professor Behrouz Far, University of Calgary "This book could replace the computer organization texts now in use that every CS and CpE student must take. . . . It is much needed, well written, and thoughtful." —Professor Larry Bernstein, Stevens Institute of Technology A distinctive, educational text on software performance and scalability This is the first book to take a quantitative approach to the subject of software performance and scalability. It brings together three unique perspectives to demonstrate how your products can be optimized and tuned for the best possible performance and scalability: The Basics—introduces the computer hardware and software architectures that predetermine the performance and scalability of a software product as well as the principles of measuring the performance and scalability of a software product Queuing Theory—helps you learn the performance laws and queuing models for interpreting the underlying physics behind software performance and scalability, supplemented with ready-to-apply techniques for improving the performance and scalability of a software system API Profiling—shows you how to design more efficient algorithms and achieve optimized performance and scalability, aided by adopting an API profiling framework (perfBasic) built on the concept of a performance map for drilling down performance root causes at the API level Software Performance and Scalability gives you a specialized skill set that will enable you to design and build performance into your products with immediate, measurable improvements. Complemented with real-world case studies, it is an indispensable resource for software developers, quality and performance assurance engineers, architects, and managers. It is an ideal text for university courses related to computer and software performance evaluation and can also be used to supplement a course in computer organization or in queuing theory for upper-division and graduate computer science students.

Software Architect The Rosen Publishing Group, Inc

Design scalable and high-performance enterprise applications using the latest features of C# 10 and .NET 6 Key Features Gain comprehensive software architecture knowledge and the skillset to create fully modular apps Solve scalability problems in web apps using enterprise architecture patterns Master new developments in front-end architecture and the application of AI for software architects Book Description Software architecture is the practice of implementing structures and systems that streamline the software development process and improve the quality of an app. This fully revised and expanded third edition, featuring the latest features of .NET 6 and C# 10, enables you to acquire the key skills, knowledge, and best practices required to become an effective software architect. Software Architecture with C# 10 and .NET 6, Third Edition features new chapters that describe the importance of the software architect, microservices with ASP.NET Core, and analyzing the architectural aspects of the front-end in the applications, including the new approach of .NET MAUI. It also includes a new chapter focused on providing a short introduction to artificial intelligence and machine learning using ML.NET, and updated chapters on Azure Kubernetes Service, EF Core, and Blazor. You will begin by understanding how to transform user requirements into architectural needs and exploring the differences between functional and non-functional requirements. Next, you will explore how to choose a cloud solution for your infrastructure, taking into account the factors that will help you manage a cloud-based app successfully. Finally, you will analyze and implement software design patterns that will allow you to solve common development problems. By the end of this book, you will be able to build and deliver highly scalable enterprise-ready apps that meet your business requirements. What you will learn Use proven techniques to overcome real-world architectural challenges Apply architectural approaches such as layered architecture Leverage tools such as containers to manage microservices effectively Get up to speed with Azure features for delivering global solutions Program and maintain Azure Functions using C#

10 Understand when it is best to use test-driven development (TDD) Implement microservices with ASP.NET Core in modern architectures Enrich your application with Artificial Intelligence Get the best of DevOps principles to enable CI/CD environments Who this book is for This book is for engineers and senior software developers aspiring to become architects or looking to build enterprise applications with the .NET Stack. Basic familiarity with C# and .NET is required to get the most out of this book.

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IoT and Edge Computing for Architects

Modern Advances in Software and Solution Algorithms for Reservoir Simulation

Software for Use

12 More Essential Skills for Software Architects

New Perspectives on Computer Concepts 2018: Comprehensive

**IT Architecture would be essential for digital consumers, emerging economies, a sustainable tomorrow, smarter organizations, new commerce, pervasive computing and healthcare economy. Next Generation IT Architecture provides valuable prescriptive reference architectures, frameworks and methodologies to address these for building tomorrow's enterprises.**

**The increasing adoption of Business Process Management (BPM) has inspired pioneering software architects and developers to effectively leverage BPM-based software and process-centric architecture (PCA) to create software systems that enable essential business processes.**

**Reflecting this emerging trend and evolving field, Process-Centric Architecture**

**Software Architecture for Big Data and the Cloud is designed to be a single resource that brings together research on how software architectures can solve the challenges imposed by building big data software systems. The challenges of big data on the software architecture can relate to scale, security, integrity, performance, concurrency, parallelism, and dependability, amongst others. Big data handling requires rethinking architectural solutions to meet functional and non-functional requirements related to volume, variety and velocity. The book's editors have varied and complementary backgrounds in requirements and architecture, specifically in software architectures for cloud and big data, as well as expertise in software engineering for cloud and big data. This book brings together work across different disciplines in software engineering, including work expanded from conference tracks and workshops led by the editors. Discusses systematic and disciplined approaches to building software architectures for cloud and big data with state-of-the-art methods and techniques Presents case studies involving enterprise, business, and government service deployment of big data applications Shares guidance on theory, frameworks, methodologies, and architecture for cloud and big data**

**There are no easy decisions in software architecture. Instead, there are many hard parts--difficult problems or issues with no best practices--that force you to choose among various compromises. With this book, you'll learn how to think critically about the trade-offs involved with distributed architectures. Architecture veterans and practicing consultants Neal Ford, Mark Richards, Pramod Sadalage, and Zhamak Dehghani discuss strategies for choosing an appropriate architecture. By interweaving a story about a fictional group of technology professionals--the Sysops Squad--they examine everything from how to determine service granularity, manage workflows and orchestration, manage and decouple contracts, and manage distributed transactions to how to optimize operational characteristics, such as scalability, elasticity, and performance. By focusing on commonly asked questions, this book provides techniques to help you discover and weigh the trade-offs as you confront the issues you face as an architect. Analyze trade-offs and effectively document your decisions Make better decisions regarding service granularity Understand the complexities of breaking apart monolithic applications Manage and decouple contracts between services Handle data in a highly distributed architecture Learn patterns to manage workflow and transactions when breaking apart applications**

**Reusable Firmware Development**

**Pattern-Oriented Software Architecture, A System of Patterns**

**Hands-On Software Architecture with Golang**

**A Quantitative Approach**

**Leading Thinkers Reveal the Hidden Beauty in Software Design**

**Software Process Technology**

***Pattern-oriented software architecture is a new approach to software development. This book represents the progression and evolution of the pattern approach into a system of patterns capable of describing and documenting large-scale applications. A pattern system provides, on one level, a pool of proven solutions to many recurring design problems. On another it shows how to combine individual patterns into heterogeneous structures and as such it can be used to facilitate a constructive development of software systems.***

***Uniquely, the patterns that are presented in this book span several levels of abstraction, from high-level architectural patterns and medium-level design patterns to low-level idioms. The intention of, and motivation for, this book is to support both novices and experts in software development. Novices will gain from the experience inherent in pattern***

*descriptions and experts will hopefully make use of, add to, extend and modify patterns to tailor them to their own needs. None of the pattern descriptions are cast in stone and, just as they are borne from experience, it is expected that further use will feed in and refine individual patterns and produce an evolving system of patterns. Visit our Web Page <http://www.wiley.com/compbooks/>*

*Understand the principles of software architecture with coverage on SOA, distributed and messaging systems, and database modeling Key FeaturesGain knowledge of architectural approaches on SOA and microservices for architectural decisionsExplore different architectural patterns for building distributed applicationsMigrate applications written in Java or Python to the Go languageBook Description Building software requires careful planning and architectural considerations; Golang was developed with a fresh perspective on building next-generation applications on the cloud with distributed and concurrent computing concerns. Hands-On Software Architecture with Golang starts with a brief introduction to architectural elements, Go, and a case study to demonstrate architectural principles. You'll then move on to look at code-level aspects such as modularity, class design, and constructs specific to Golang and implementation of design patterns. As you make your way through the chapters, you'll explore the core objectives of architecture such as effectively managing complexity, scalability, and reliability of software systems. You'll also work through creating distributed systems and their communication before moving on to modeling and scaling of data. In the concluding chapters, you'll learn to deploy architectures and plan the migration of applications from other languages. By the end of this book, you will have gained insight into various design and architectural patterns, which will enable you to create robust, scalable architecture using Golang. What you will learnUnderstand architectural paradigms and deep dive into MicroservicesDesign parallelism/concurrency patterns and learn object-oriented design patterns in GoExplore API-driven systems architecture with introduction to REST and GraphQL standardsBuild event-driven architectures and make your architectures anti-fragileEngineer scalability and learn how to migrate to Go from other languagesGet to grips with deployment considerations with CICD pipeline, cloud deployments, and so onBuild an end-to-end e-commerce (travel) application backend in GoWho this book is for Hands-On Software Architecture with Golang is for software developers, architects, and CTOs looking to use Go in their software architecture to build enterprise-grade applications. Programming knowledge of Golang is assumed.*

*This book covers everything you need to master the iSAQB® Certified Professional for Software Architecture - Foundation Level (CPSA-F) certification. This internationally renowned education and certification schema defines various learning path for practical software architects. This book concentrates on the foundation level examination. It explains and clarifies all 40+ learning goals of the CPSA-F® curriculum. In addition, you find step-by-step preparation guide for the examination. Please beware: This book is not meant as a replacement for existing software architecture books and courses, but strongly focusses on explaining and clarifying the iSAQB CPSA-F foundation.*

*Software Architecture with C# 10 and .NET 6*

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