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Secure Software Design

Jones & Bartlett Publishers Networking & Security.

Designing Secure Software

A Guide for Developers

No Starch Press What every software professional should know about security. Designing Secure Software consolidates Loren Kohnfelder's more than twenty years of experience into a concise, elegant guide to improving the security of technology products. Written for a wide range of software professionals, it emphasizes building security into software design early and involving the entire team in the process. The book begins with a discussion of core concepts like trust, threats, mitigation, secure design patterns, and cryptography. The second part, perhaps this book's most unique and important contribution to the field, covers the process of designing and reviewing a software design with security considerations in mind. The final section details the most common coding flaws that create vulnerabilities, making copious use of code snippets written in C and Python to illustrate implementation vulnerabilities. You'll learn how to:

- *Identify important assets, the attack surface, and the trust boundaries in a system*
- *Evaluate the effectiveness of various threat mitigation candidates*
- *Work with well-known secure coding patterns and libraries*
- *Understand and*

prevent vulnerabilities like XSS and CSRF, memory flaws, and more • Use security testing to proactively identify vulnerabilities introduced into code • Review a software design for security flaws effectively and without judgment Kohnfelder's career, spanning decades at Microsoft and Google, introduced numerous software security initiatives, including the co-creation of the STRIDE threat modeling framework used widely today. This book is a modern, pragmatic consolidation of his best practices, insights, and ideas about the future of software.

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Secure By Design

Manning Publications As a developer, you need to build software in a secure way. But you can't spend all your time focusing on security. The answer is to use good design principles, tools, and mindsets that make security an implicit result - it's secure by design. Secure by Design teaches developers how to use design to drive security in software development. This book is full of patterns, best practices, and mindsets that you can directly apply to your real world development. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications.

Security Patterns in Practice

Designing Secure Architectures Using Software Patterns

Wiley Learn to combine security theory and code to produce secure systems Security is clearly a crucial issue to consider during the design and implementation of any distributed software architecture. Security patterns are increasingly being used by developers who take security into serious consideration from the creation of their work. Written by the authority on security patterns, this unique book examines the structure and purpose of security patterns, illustrating their use with the help of detailed implementation advice, numerous code samples, and descriptions in UML. Provides an extensive, up-to-date catalog of security patterns Shares real-world case studies so you can see when and how to use security patterns in practice Details how to incorporate security from the conceptual stage Highlights tips on authentication, authorization, role-based access control, firewalls, wireless networks, middleware, VoIP, web services security, and more Author is well known and highly respected in the field of security and an expert on security patterns Security Patterns in Practice shows you how to confidently develop a secure system step by step.

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Designing Usable and Secure Software with IRIS and CAIRIS

Springer Everyone expects the products and services they use to be secure, but 'building security in' at the earliest stages of a system's design also means designing for use as well. Software that is unusable to end-users and unwieldy to developers and administrators may be insecure as errors and violations may expose exploitable vulnerabilities. This book shows how practitioners and researchers can build both security and usability into the design of systems. It introduces the IRIS framework and the open source CAIRIS platform that can guide the specification of secure and usable software. It also illustrates how IRIS and CAIRIS can complement techniques from User Experience, Security Engineering and Innovation & Entrepreneurship in ways that allow security to be addressed at different stages of the software lifecycle without disruption. Real-world examples are provided of the techniques and processes illustrated in this book, making this text a resource for practitioners, researchers, educators, and students.

Security Patterns

Integrating Security and Systems Engineering

John Wiley & Sons Most security books are targeted at security engineers and specialists. Few show how build security into software. None breakdown the different concerns facing security at different levels of the system: the enterprise, architectural and operational layers. Security Patterns addresses the full spectrum of security in systems design, using best practice solutions to show how to integrate security in the broader engineering process. Essential for designers building large-scale systems who want best practice solutions to typical security problems Real world case studies illustrate how to use the patterns in specific domains For more information visit www.securitypatterns.org

Secure and Resilient Software Development

CRC Press Although many software books highlight open problems in secure software development, few provide easily actionable, ground-level solutions. Breaking the mold, Secure and Resilient Software Development teaches you how to apply best practices and standards for consistent and secure software development. It details specific quality software developmen

Threat Modeling

Designing for Security

John Wiley & Sons The only security book to be chosen as a Dr. Dobbs Jolt Award Finalist since Bruce Schneier's Secrets and Lies and Applied Cryptography! Adam Shostack is responsible for security development lifecycle threat modeling at Microsoft and is one of a handful of threat modeling experts in the world. Now, he is sharing his considerable expertise into this unique book. With pages of specific actionable advice, he details how to build better security into the design of systems, software, or services from the outset. You'll explore various threat modeling approaches, find out how to test your designs against threats, and learn effective ways to address threats that have been validated at Microsoft and other top companies. Systems security managers, you'll find tools and a

framework for structured thinking about what can go wrong. Software developers, you'll appreciate the jargon-free and accessible introduction to this essential skill. Security professionals, you'll learn to discern changing threats and discover the easiest ways to adopt a structured approach to threat modeling. Provides a unique how-to for security and software developers who need to design secure products and systems and test their designs Explains how to threat model and explores various threat modeling approaches, such as asset-centric, attacker-centric and software-centric Provides effective approaches and techniques that have been proven at Microsoft and elsewhere Offers actionable how-to advice not tied to any specific software, operating system, or programming language Authored by a Microsoft professional who is one of the most prominent threat modeling experts in the world As more software is delivered on the Internet or operates on Internet-connected devices, the design of secure software is absolutely critical. Make sure you're ready with Threat Modeling: Designing for Security.

Building Secure and Reliable Systems

Best Practices for Designing, Implementing, and Maintaining Systems

O'Reilly Media Can a system be considered truly reliable if it isn't fundamentally secure? Or can it be considered secure if it's unreliable? Security is crucial to the design and operation of scalable systems in production, as it plays an important part in product quality, performance, and availability. In this book, experts from Google share best practices to help your organization design scalable and reliable systems that are fundamentally secure. Two previous O'Reilly books from Google—Site Reliability Engineering and The Site Reliability Workbook—demonstrated how and why a commitment to the entire service lifecycle enables organizations to successfully build, deploy, monitor, and maintain software systems. In this latest guide, the authors offer insights into system design, implementation, and maintenance from practitioners who specialize in security and reliability. They also discuss how building and adopting their recommended best practices requires a culture that's supportive of such change. You'll learn about secure and reliable systems through: Design strategies Recommendations for coding, testing, and debugging practices Strategies to prepare for, respond to, and recover from incidents Cultural best practices that help teams across your organization collaborate effectively

Security and Usability

Designing Secure Systems that People Can Use

"O'Reilly Media, Inc." Human factors and usability issues have traditionally played a limited role in security research and secure systems development. Security experts have largely ignored usability issues--both because they often failed to recognize the importance of human factors and because they lacked the expertise to address them. But there is a growing recognition that today's security problems can be solved only by addressing issues of usability and human factors. Increasingly, well-publicized security breaches are attributed to human errors that might have been prevented through more usable software. Indeed, the world's future cyber-security depends upon the deployment of security technology that can be broadly used by untrained computer users. Still, many people believe there is an inherent tradeoff between computer security and usability. It's true that a computer without passwords is usable, but not very secure. A computer that makes you authenticate every five minutes with a password and a fresh drop of blood might be very secure, but nobody would use it. Clearly, people need computers, and if they can't use one that's secure, they'll use one that isn't. Unfortunately, unsecured systems aren't usable for long, either. They get hacked, compromised, and otherwise rendered useless. There is increasing agreement that we need to design secure systems that people can actually use, but less agreement about how to reach this goal. Security & Usability is the first book-length work describing the current state of the art in this emerging field. Edited by security experts Dr. Lorrie Faith Cranor and Dr. Simson Garfinkel, and authored by cutting-edge security and human-computerinteraction (HCI) researchers world-wide, this volume is expected to become both a classic reference and an inspiration for future research. Security & Usability groups 34 essays into six parts: Realigning Usability and Security---with careful attention to user-centered design principles, security and usability can be synergistic. Authentication Mechanisms-- techniques for identifying and authenticating computer users. Secure Systems--how system software can deliver or destroy a secure user experience. Privacy and Anonymity Systems--methods for allowing people to control the release of personal information. Commercializing Usability: The Vendor Perspective--specific experiences of security and software vendors (e.g., IBM, Microsoft, Lotus, Firefox, and Zone Labs) in addressing usability. The Classics--groundbreaking papers that sparked the field of security and usability. This book is expected to start an avalanche of discussion, new ideas, and further advances in this important field.

Exploring Security in Software Architecture and Design

IGI Global Cyber-attacks continue to rise as more individuals rely on storing personal information on networks. Even though these networks are continuously checked and secured, cybercriminals find new strategies to break through these protections. Thus, advanced security systems, rather than simple security patches, need to be designed and developed. Exploring Security in Software Architecture and Design is an essential reference source that discusses the development of security-aware software systems that are built into every phase of the software architecture. Featuring research on topics such as migration techniques, service-based software, and building security, this book is ideally designed for computer and software engineers, ICT specialists, researchers, academicians, and field experts.

Development of Secure Software with Security by Design

Trends and Strategy Report.

Building Secure Software

How to Avoid Security Problems the Right Way

Pearson Education Most organizations have a firewall, antivirus software, and intrusion detection systems, all of which are intended to keep attackers out. So why is computer security a bigger problem today than ever before? The answer is simple--bad software lies at the heart of all computer security problems. Traditional solutions simply treat the symptoms, not the problem, and usually do so in a reactive way. This book teaches you how to take a proactive approach to computer security. Building Secure Software cuts to the heart of computer security to help you get security right the first time. If you are serious about computer security, you need to read this book, which includes essential lessons for both security professionals who have come to realize that software is the problem, and

software developers who intend to make their code behave. Written for anyone involved in software development and use—from managers to coders—this book is your first step toward building more secure software. Building Secure Software provides expert perspectives and techniques to help you ensure the security of essential software. If you consider threats and vulnerabilities early in the development cycle you can build security into your system. With this book you will learn how to determine an acceptable level of risk, develop security tests, and plug security holes before software is even shipped. Inside you'll find the ten guiding principles for software security, as well as detailed coverage of: Software risk management for security Selecting technologies to make your code more secure Security implications of open source and proprietary software How to audit software The dreaded buffer overflow Access control and password authentication Random number generation Applying cryptography Trust management and input Client-side security Dealing with firewalls Only by building secure software can you defend yourself against security breaches and gain the confidence that comes with knowing you won't have to play the "penetrate and patch" game anymore. Get it right the first time. Let these expert authors show you how to properly design your system; save time, money, and credibility; and preserve your customers' trust.

Secure Development for Mobile Apps

How to Design and Code Secure Mobile Applications with PHP and JavaScript

Auerbach Publications The world is becoming increasingly mobile. Smartphones and tablets have become more powerful and popular, with many of these devices now containing confidential business, financial, and personal information. This has led to a greater focus on mobile software security. Establishing mobile software security should be of primary concern to every mobile application developer. This book explains how you can create mobile social applications that incorporate security throughout the development process. Although there are many books that address security issues, most do not explain how to incorporate security into the building process. Secure Development for Mobile Apps does exactly that. Its step-by-step guidance shows you how to integrate security measures into social apps running on mobile platforms. You will learn how to design and code apps with security as part of the process and not an afterthought. The author outlines best practices to help you build better, more secure software. This book provides a comprehensive guide to techniques for secure development practices. It covers PHP security practices and tools, project layout

templates, PHP and PDO, PHP encryption, and guidelines for secure session management, form validation, and file uploading. The book also demonstrates how to develop secure mobile apps using the APIs for Google Maps, YouTube, jQuery Mobile, Twitter, and Facebook. While this is not a beginner's guide to programming, you should have no problem following along if you've spent some time developing with PHP and MySQL.

The 7 Qualities of Highly Secure Software

CRC Press The 7 Qualities of Highly Secure Software provides a framework for designing, developing, and deploying hacker-resilient software. It uses engaging anecdotes and analogies—ranging from Aesop's fables, athletics, architecture, biology, nursery rhymes, and video games—to illustrate the qualities that are essential for the development of highly secure software. Each chapter details one of the seven qualities that can make your software highly secure and less susceptible to hacker threats. Leveraging real-world experiences and examples, the book: Explains complex security concepts in language that is easy to understand for professionals involved in management, software development, and operations Specifies the qualities and skills that are essential for building secure software Highlights the parallels between the habits of effective people and qualities in terms of software security Praise for the Book: This will be required reading for my executives, security team, software architects and lead developers. —David W. Stender, CISSP, CSSLP, CAP, CISO of the US Internal Revenue Service Developing highly secure software should be at the forefront of organizational strategy and this book provides a framework to do so. —Troy Leach, CTO, PCI Security Standards Council This book will teach you the core, critical skills needed to raise the security bar on the attackers and swing the game in your favor. —Michael Howard, Principal Cyber Security Program Manager, Microsoft As a penetration tester, my job will be a lot harder as people read this book! —Kevin Johnson, Security Consultant, Secure Ideas

Designing Secure IoT Devices with the Arm Platform Security Architecture and Cortex-M33

Newnes Designing Secure IoT devices with the Arm Platform Security Architecture and Cortex-M33 explains how to design and deploy secure IoT devices based on the Cortex-M23/M33 processor. The book is split into three parts. First, it introduces the Cortex-M33 and its architectural design and major processor peripherals. Second, it shows how to design secure software and secure communications to minimize the threat of both hardware and software hacking. And finally, it examines common IoT cloud systems and how to design

and deploy a fleet of IoT devices. Example projects are provided for the Keil MDK-ARM and NXP LPCXpresso tool chains. Since their inception, microcontrollers have been designed as functional devices with a CPU, memory and peripherals that can be programmed to accomplish a huge range of tasks. With the growth of internet connected devices and the Internet of Things (IoT), "plain old microcontrollers" are no longer suitable as they lack the features necessary to create both a secure and functional device. The recent development by ARM of the Cortex M23 and M33 architecture is intended for today's IoT world. Shows how to design secure software and secure communications using the ARM Cortex M23- and M33-based micro controllers Explains how to write secure code to minimize vulnerabilities using the CERT-C coding standard Uses the mbedTLS library to implement modern cryptography

Software Architecture with Python

Packt Publishing Ltd 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.

The Security Development Lifecycle

SDL, a Process for Developing Demonstrably More Secure Software

Describes how to put software security into practice, covering such topics as risk analysis, coding policies, Agile Methods, cryptographic standards, and threat tree patterns.

Embedded Systems Security

Practical Methods for Safe and Secure Software and Systems Development

Elsevier Front Cover; Dedication; Embedded Systems Security: Practical Methods for Safe and Secure Software and Systems Development; Copyright; Contents; Foreword; Preface; About this Book; Audience; Organization; Approach; Acknowledgements; Chapter 1 -- Introduction to Embedded Systems Security; 1.1 What is Security?; 1.2 What is an Embedded System?; 1.3 Embedded Security Trends; 1.4 Security Policies; 1.5 Security Threats; 1.6 Wrap-up; 1.7 Key Points; 1.8 Bibliography and Notes; Chapter 2 -- Systems Software Considerations; 2.1 The Role of the Operating System; 2.2 Multiple Independent Levels of Security.

Applicability of Neural Networks to Software Security

Software design flaws account for 50% software security vulnerability today. As attacks on vulnerable software continue to increase, the demand for secure software is also increasing thereby putting software developers under more pressure. This is especially true for

those developers whose primary aim is to produce their software quickly under tight deadlines in order to release it into the market early. While there are many tools focusing on implementation problems during software development lifecycle (SDLC), this does not provide a complete solution in resolving software security problems. Therefore designing software with security in mind will go a long way in developing secure software. However, most of the current approaches used for evaluating software designs require the involvement of security experts because many software developers often lack the required expertise in making their software secure. In this research the current approaches used in integrating security at the design level is discussed and a new method of evaluating software design using neural network as evaluation tool is presented. With the aid of the proposed neural network tool, this research found out that software design scenarios can be matched to attack patterns that identify the security flaws in the design scenarios. Also, with the proposed neural network tool this research found out that the identified attack patterns can be matched to security patterns that can provide mitigation to the threat in the attack pattern.

Designing Secure Architectures Using Software Patterns

Createspace Independent Publishing Platform Written by the authority on security patterns, this unique book examines the structure and purpose of security patterns, illustrating their use with the help of detailed implementation advice, numerous code samples, and descriptions in UML. Security is clearly a crucial issue to consider during the design and implementation of any distributed software architecture. Security patterns are increasingly being used by developers who take security into serious consideration from the creation of their work.

Information Security Education Across the Curriculum

9th IFIP WG 11.8 World Conference, WISE 9, Hamburg, Germany, May 26-28, 2015, Proceedings

Springer This book constitutes the refereed proceedings of the 9th IFIP WG 11.8 World Conference on Security Education, WISE 9, held in Hamburg, Germany, in May 2015. The 11 revised papers presented together with 2 invited papers were carefully reviewed and selected from 20 submissions. They are organized in topical sections on innovative methods, software security education, tools and

applications for teaching, and syllabus design.

Threat Modeling

Designing for Security

CreateSpace Adam Shostack is responsible for security development lifecycle threat modeling at Microsoft and is one of a handful of threat modeling experts in the world. Now, he is sharing his considerable expertise into this unique book. With pages of specific actionable advice, he details how to build better security into the design of systems, software, or services from the outset. You'll explore various threat modeling approaches, find out how to test your designs against threats, and learn effective ways to address threats that have been validated at Microsoft and other top companies. Systems security managers, you'll find tools and a framework for structured thinking about what can go wrong. Software developers, you'll appreciate the jargon-free and accessible introduction to this essential skill. Security professionals, you'll learn to discern changing threats and discover the easiest ways to adopt a structured approach to threat modeling. Provides a unique how-to for security and software developers who need to design secure products and systems and test their designs Explains how to threat model and explores various threat modeling approaches, such as asset-centric, attacker-centric and software-centric Provides effective approaches and techniques that have been proven at Microsoft and elsewhere Offers actionable how-to advice not tied to any specific software, operating system, or programming language Authored by a Microsoft professional who is one of the most prominent threat modeling experts in the world As more software is delivered on the Internet or operates on Internet-connected devices, the design of secure software is absolutely critical. Make sure you're ready with Threat Modeling: Designing for Security.

Foundations of Security

What Every Programmer Needs to Know

Apress Software developers need to worry about security as never before. They need clear guidance on safe coding practices, and that's exactly what this book delivers. The book does not delve deep into theory, or rant about the politics of security. Instead, it clearly and simply lays out the most common threats that programmers need to defend against. It then shows programmers how to

make their defense. The book takes a broad focus, ranging over SQL injection, worms and buffer overflows, password security, and more. It sets programmers on the path towards successfully defending against the entire gamut of security threats that they might face.

Towards a More Systematic Approach to Secure Systems Design and Analysis

The task of designing secure software systems is fraught with uncertainty, as data on uncommon attacks is limited, costs are difficult to estimate, and technology and tools are continually changing. Consequently, experts may interpret the security risks posed to a system in different ways, leading to variation in assessment. This paper presents research into measuring the variability in decision making between security professionals, with the ultimate goal of improving the quality of security advice given to software system designers. A set of thirty nine cyber-security experts took part in an exercise in which they independently assessed a realistic system scenario. This study quantifies agreement in the opinions of experts, examines methods of aggregating opinions, and produces an assessment of attacks from ratings of their components. We show that when aggregated, a coherent consensus view of security emerges which can be used to inform decisions made during systems design.

Designing Data-Intensive Applications

The Big Ideas Behind Reliable, Scalable, and Maintainable Systems

"O'Reilly Media, Inc." Data is at the center of many challenges in system design today. Difficult issues need to be figured out, such as scalability, consistency, reliability, efficiency, and maintainability. In addition, we have an overwhelming variety of tools, including relational databases, NoSQL datastores, stream or batch processors, and message brokers. What are the right choices for your application? How do you make sense of all these buzzwords? In this practical and comprehensive guide, author Martin Kleppmann helps you navigate this diverse landscape by examining the pros and cons of various technologies for processing and storing data.

Software keeps changing, but the fundamental principles remain the same. With this book, software engineers and architects will learn how to apply those ideas in practice, and how to make full use of data in modern applications. Peer under the hood of the systems you already use, and learn how to use and operate them more effectively Make informed decisions by identifying the strengths and weaknesses of different tools Navigate the trade-offs around consistency, scalability, fault tolerance, and complexity Understand the distributed systems research upon which modern databases are built Peek behind the scenes of major online services, and learn from their architectures

Hardware Security

Design, Threats, and Safeguards

CRC Press Beginning with an introduction to cryptography, Hardware Security: Design, Threats, and Safeguards explains the underlying mathematical principles needed to design complex cryptographic algorithms. It then presents efficient cryptographic algorithm implementation methods, along with state-of-the-art research and strategies for the design of very large scale integrated (VLSI) circuits and symmetric cryptosystems, complete with examples of Advanced Encryption Standard (AES) ciphers, asymmetric ciphers, and elliptic curve cryptography (ECC). Gain a Comprehensive Understanding of Hardware Security—from Fundamentals to Practical Applications Since most implementations of standard cryptographic algorithms leak information that can be exploited by adversaries to gather knowledge about secret encryption keys, Hardware Security: Design, Threats, and Safeguards: Details algorithmic- and circuit-level countermeasures for attacks based on power, timing, fault, cache, and scan chain analysis Describes hardware intellectual property piracy and protection techniques at different levels of abstraction based on watermarking Discusses hardware obfuscation and physically unclonable functions (PUFs), as well as Trojan modeling, taxonomy, detection, and prevention Design for Security and Meet Real-Time Requirements If you consider security as critical a metric for integrated circuits (ICs) as power, area, and performance, you'll embrace the design-for-security methodology of Hardware Security: Design, Threats, and Safeguards.

Application Security for the Android Platform

Processes, Permissions, and Other Safeguards

"O'Reilly Media, Inc." This book will educate readers on the need for application security and secure coding practices when designing any app. No prior knowledge of security or secure programming techniques is assumed. The book will discuss the need for such practices, how the Android environment is structured with respect to security considerations, what services and techniques are available on the platform to protect data, and how developers can build and code applications that address the risk to their applications and the data processed by them. This text is especially important now, as Android is fast becoming the mobile platform target of choice for attackers attempting to steal data from mobile devices.

Secure, Resilient, and Agile Software Development

CRC Press A collection of best practices and effective implementation recommendations that are proven to work, Secure, Resilient, and Agile Software Development leaves the boring details of software security theory out of the discussion as much as possible to concentrate on practical applied software security for practical people. Written to aid your career as well as your organization, the book shows how to gain skills in secure and resilient software development and related tasks. The book explains how to integrate these development skills into your daily duties, thereby increasing your professional value to your company, your management, your community, and your industry. Secure, Resilient, and Agile Software Development was written for the following professionals: AppSec architects and program managers in information security organizations Enterprise architecture teams with application development focus Scrum teams DevOps teams Product owners and their managers Project managers Application security auditors With a detailed look at Agile and Scrum software development methodologies, this book explains how security controls need to change in light of an entirely new paradigm on how software is developed. It focuses on ways to educate everyone who has a hand in any software development project with appropriate and practical skills to Build Security In. After covering foundational and fundamental principles for secure application design, this book dives into concepts, techniques, and design goals to meet well-understood acceptance criteria on features an application must implement. It also explains how the design sprint is adapted for proper consideration of security as well as defensive programming techniques. The book concludes with a look at white box application analysis and sprint-based activities to improve the security and quality of software under development.

Engineering Secure Software and Systems

Third International Symposium, ESSoS 2011, Madrid, Spain, February 9-10, 2011, Proceedings

Springer Science & Business Media This book constitutes the refereed proceedings of the Third International Symposium on Engineering Secure Software and Systems, ESSoS 2011, held in Madrid, Italy, in February 2011. The 18 revised full papers presented together with 3 idea papers were carefully reviewed and selected from 63 submissions. The papers are organized in topical sections on model-based security, tools and mechanisms, Web security, security requirements engineering, and authorization.

Engineering Safe and Secure Software Systems

Artech House This first-of-its-kind resource offers a broad and detailed understanding of software systems engineering from both security and safety perspectives. Addressing the overarching issues related to safeguarding public data and intellectual property, the book defines such terms as systems engineering, software engineering, security, and safety as precisely as possible, making clear the many distinctions, commonalities, and interdependencies among various disciplines. You explore the various approaches to risk and the generation and analysis of appropriate metrics. This unique book explains how processes relevant to the creation and operation of software systems should be determined and improved, how projects should be managed, and how products can be assured. You learn the importance of integrating safety and security into the development life cycle. Additionally, this practical volume helps identify what motivators and deterrents can be put in place in order to implement the methods that have been recommended.

Designing for Safe Use

100 Principles for Making Products Safer

CRC Press How do you prevent a critical care nurse from accidentally delivering a morphine overdose to an ill patient? Or ensure that people don't insert their arm into a hydraulic mulcher? And what about enabling trapped airline passengers to escape safely in an emergency? Product designers and engineers face myriad such questions every day. Failure to answer them correctly can result in product designs that lead to injury or even death due to use error. Historically, designers and engineers have searched for answers by sifting through complicated safety standards or obscure industry guidance documents. *Designing for Safe Use* is the first comprehensive source of safety-focused design principles for product developers working in any industry. Inside you'll find 100 principles that help ensure safe interactions with products as varied as baby strollers, stepladders, chainsaws, automobiles, apps, medication packaging, and even airliners. You'll discover how protective features such as blade guards, roll bars, confirmation screens, antimicrobial coatings, and functional groupings can protect against a wide range of dangerous hazards, including sharp edges that can lacerate, top-heavy items that can roll over and crush, fumes that can poison, and small parts that can pose a choking hazard. *Special book features include:* Concise, illustrated descriptions of design principles Sample product designs that illustrate the book's guidelines and exemplify best practices Literature references for readers interested in learning more about specific hazards and protective measures Statistics on the number of injuries that have arisen in the past due to causes that might be eliminated by applying the principles in the book Despite its serious subject matter, the book's friendly tone, surprising anecdotes, bold visuals, and occasional attempts at dry humor will keep you interested in the art and science of making products safer. Whether you read the book cover-to-cover or jump around, the book's relatable and practical approach will help you learn a lot about making products safe. *Designing for Safe Use* is a primer that will spark in readers a strong appreciation for the need to design safety into products. This reference is for designers, engineers, and students who seek a broad knowledge of safe design solutions. .

Writing Secure Code

Pearson Education Keep black-hat hackers at bay with the tips and techniques in this entertaining, eye-opening book! Developers will learn how to padlock their applications throughout the entire development process—from designing secure applications to writing robust code that can withstand repeated attacks to testing applications for security flaws. Easily digested chapters reveal proven principles, strategies, and coding techniques. The authors—two battle-scarred veterans who have solved some of the industry's toughest security problems—provide sample code in several languages. This edition includes updated information about threat

modeling, designing a security process, international issues, file-system issues, adding privacy to applications, and performing security code reviews. It also includes enhanced coverage of buffer overruns, Microsoft .NET security, and Microsoft ActiveX development, plus practical checklists for developers, testers, and program managers.

High-assurance Design

Architecting Secure and Reliable Enterprise Applications

Addison-Wesley Professional More than ever business applications need to be reliable and secure and Berg shows architects how to focus efforts where it matters.

Secure Coding in C and C++

Pearson Education "The security of information systems has not improved at a rate consistent with the growth and sophistication of the attacks being made against them. To address this problem, we must improve the underlying strategies and techniques used to create our systems. Specifically, we must build security in from the start, rather than append it as an afterthought. That's the point of Secure Coding in C and C++. In careful detail, this book shows software developers how to build high-quality systems that are less vulnerable to costly and even catastrophic attack. It's a book that every developer should read before the start of any serious project."

--Frank Abagnale, author, lecturer, and leading consultant on fraud prevention and secure documents Learn the Root Causes of Software Vulnerabilities and How to Avoid Them Commonly exploited software vulnerabilities are usually caused by avoidable software defects. Having analyzed nearly 18,000 vulnerability reports over the past ten years, the CERT/Coordination Center (CERT/CC) has determined that a relatively small number of root causes account for most of them. This book identifies and explains these causes and shows the steps that can be taken to prevent exploitation. Moreover, this book encourages programmers to adopt security best practices and develop a security mindset that can help protect software from tomorrow's attacks, not just today's. Drawing on the CERT/CC's reports and conclusions, Robert Seacord systematically identifies the program errors most likely to lead to security breaches, shows how they can be exploited, reviews the potential consequences, and presents secure alternatives. Coverage includes technical detail on how to improve the overall security of any C/C++ application Thwart buffer overflows and stack-smashing attacks that exploit insecure string manipulation logic Avoid vulnerabilities and security flaws resulting from the incorrect use of

dynamic memory management functions Eliminate integer-related problems: integer overflows, sign errors, and truncation errors Correctly use formatted output functions without introducing format-string vulnerabilities Avoid I/O vulnerabilities, including race conditions Secure Coding in C and C++ presents hundreds of examples of secure code, insecure code, and exploits, implemented for Windows and Linux. If you're responsible for creating secure C or C++ software--or for keeping it safe--no other book offers you this much detailed, expert assistance.

Computer Architecture and Security

Fundamentals of Designing Secure Computer Systems

John Wiley & Sons The first book to introduce computer architecture for security and provide the tools to implement secure computer systems This book provides the fundamentals of computer architecture for security. It covers a wide range of computer hardware, system software and data concepts from a security perspective. It is essential for computer science and security professionals to understand both hardware and software security solutions to survive in the workplace. Examination of memory, CPU architecture and system implementation Discussion of computer buses and a dual-port bus interface Examples cover a board spectrum of hardware and software systems Design and implementation of a patent-pending secure computer system Includes the latest patent-pending technologies in architecture security Placement of computers in a security fulfilled network environment Co-authored by the inventor of the modern Computed Tomography (CT) scanner Provides website for lecture notes, security tools and latest updates

Site Reliability Engineering

How Google Runs Production Systems

"O'Reilly Media, Inc." In this collection of essays and articles, key members of Google's Site Reliability Team explain how and why their commitment to the entire lifecycle has enabled the company to successfully build, deploy, monitor, and maintain some of the largest software systems in the world.

Design, Development, and Use of Secure Electronic Voting Systems

Information Science Reference In modern electoral processes, Information and Communication Technologies play a crucial role, whether used in voter registration, ballot casting, or processing of results. Securing these systems is a necessary step in ensuring the fairness of the democratic process. *Design, Development, and Use of Secure Electronic Voting Systems* analyzes current research on the integration of modern technologies with traditional democratic systems, providing a framework for designing and deploying electronic voting systems in any context or society. Stakeholders, researchers, architects, designers, and scholars interested in the use of electronic systems in government processes will use this book to gain a broader understanding of some of the latest advances in this emerging field.