

Attacking Network Protocols

Network Attacks and Exploitation
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Learning Network Forensics

Network Attacks and Exploitation

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refereed proceedings of the 11th IFIP WG 6.6 International Conference on Autonomous Infrastructure, Management, and Security, AIMS 2017, held in Zurich, Switzerland, in July 2017. The 8 full papers presented together with 11 short papers were carefully reviewed and selected from 24 submissions. The papers are organized in the following topical sections: security management; management of cloud environments and services, evaluation and experimental study of rich network services; security, intrusion detection, and configuration; autonomic and self-management solutions; and methods for the protection of infrastructure.

The Practice of Network Security Monitoring

Take an in-depth tour of core Internet protocols and learn how they work together to move data packets from one network to another. With this concise book, you'll delve into the aspects of each protocol, including operation basics and security risks, and learn the function of network hardware such as switches and routers. Ideal for beginning network engineers, each chapter in this book includes a set of review questions, as well as practical, hands-on lab exercises. Understand basic network architecture, and how protocols and functions fit together. Learn the structure and operation of the Eth.

Practical Packet Analysis

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Expert guidance on designing secure networks Understand security best practices and how to take advantage of the networking gear you already have Review designs for campus, edge, and teleworker networks of varying sizes Learn design considerations for device hardening, Layer 2 and Layer 3 security issues, denial of service, IPsec VPNs, and network identity Understand security design considerations for common applications such as DNS, mail, and web Identify the key security roles and placement issues for network security elements such as firewalls, intrusion detection systems, VPN gateways, content filtering, as well as for traditional network infrastructure devices such as routers and switches Learn 10 critical steps to designing a security system for your network Examine secure network management designs that allow your management communications to be secure while still maintaining maximum utility Try your hand at security design with three included case studies Benefit from the experience of the principal architect of the original Cisco Systems SAFE Security Blueprint Written by the principal architect of the original Cisco Systems SAFE Security Blueprint, Network Security Architectures is your comprehensive how-to guide to designing and implementing a secure network. Whether your background is security or networking, you can use this book to learn how to bridge the gap between a highly available, efficient network and one that strives to maximize security. The included secure network design techniques focus on making network and security technologies work together as a unified system rather than as isolated systems deployed in an ad-hoc way. Beginning where other security books leave off,

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Network Security Architectures shows you how the various technologies that make up a security system can be used together to improve your network's security. The technologies and best practices you'll find within are not restricted to a single vendor but broadly apply to virtually any network system. This book discusses the whys and hows of security, from threats and counter measures to how to set up your security policy to mesh with your network architecture. After learning detailed security best practices covering everything from Layer 2 security to e-commerce design, you'll see how to apply the best practices to your network and learn to design your own security system to incorporate the requirements of your security policy. You'll review detailed designs that deal with today's threats through applying defense-in-depth techniques and work through case studies to find out how to modify the designs to address the unique considerations found in your network. Whether you are a network or security engineer, Network Security Architectures will become your primary reference for designing and building a secure network. This book is part of the Networking Technology Series from Cisco Press, which offers networking professionals valuable information for constructing efficient networks, understanding new technologies, and building successful careers.

Practical IoT Hacking

Uses real-world bug reports (vulnerabilities in software or in this case web

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applications) to teach programmers and InfoSec professionals how to discover and protect vulnerabilities in web applications. *Real-World Bug Hunting* is a field guide to finding software bugs. Ethical hacker Peter Yaworski breaks down common types of bugs, then contextualizes them with real bug bounty reports released by hackers on companies like Twitter, Facebook, Google, Uber, and Starbucks. As you read each report, you'll gain deeper insight into how the vulnerabilities work and how you might find similar ones. Each chapter begins with an explanation of a vulnerability type, then moves into a series of real bug bounty reports that show how the bugs were found. You'll learn things like how Cross-Site Request Forgery tricks users into unknowingly submitting information to websites they are logged into; how to pass along unsafe JavaScript to execute Cross-Site Scripting; how to access another user's data via Insecure Direct Object References; how to trick websites into disclosing information with Server Side Request Forgeries; and how bugs in application logic can lead to pretty serious vulnerabilities. Yaworski also shares advice on how to write effective vulnerability reports and develop relationships with bug bounty programs, as well as recommends hacking tools that can make the job a little easier.

Security Engineering

In *Securing VoIP Networks*, two leading experts systematically review the security risks and vulnerabilities associated with VoIP networks and offer proven, detailed

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recommendations for securing them. Drawing on case studies from their own fieldwork, the authors address VoIP security from the perspective of real-world network implementers, managers, and security specialists. The authors identify key threats to VoIP networks, including eavesdropping, unauthorized access, denial of service, masquerading, and fraud; and review vulnerabilities in protocol design, network architecture, software, and system configuration that place networks at risk. They discuss the advantages and tradeoffs associated with protection mechanisms built into SIP, SRTP, and other VoIP protocols; and review key management solutions such as MIKEY and ZRTP. Next, they present a complete security framework for enterprise VoIP networks, and provide detailed architectural guidance for both service providers and enterprise users.

- 1 Introduction
- 2 VoIP Architectures and Protocols
- 3 Threats and Attacks
- 4 VoIP Vulnerabilities
- 5 Signaling Protection Mechanisms
- 6 Media Protection Mechanisms
- 7 Key Management Mechanisms
- 8 VoIP and Network Security Controls
- 9 A Security Framework for Enterprise VoIP Networks
- 10 Provider Architectures and Security
- 11 Enterprise Architectures and Security

Practical Binary Analysis

Incorporate offense and defense for a more effective network security strategy. Network Attacks and Exploitation provides a clear, comprehensive roadmap for developing a complete offensive and defensive strategy to engage in or thwart

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hacking and computer espionage. Written by an expert in both government and corporate vulnerability and security operations, this guide helps you understand the principles of the space and look beyond the individual technologies of the moment to develop durable comprehensive solutions. Numerous real-world examples illustrate the offensive and defensive concepts at work, including Conficker, Stuxnet, the Target compromise, and more. You will find clear guidance toward strategy, tools, and implementation, with practical advice on blocking systematic computer espionage and the theft of information from governments, companies, and individuals. Assaults and manipulation of computer networks are rampant around the world. One of the biggest challenges is fitting the ever-increasing amount of information into a whole plan or framework to develop the right strategies to thwart these attacks. This book clears the confusion by outlining the approaches that work, the tools that work, and resources needed to apply them. Understand the fundamental concepts of computer network exploitation. Learn the nature and tools of systematic attacks. Examine offensive strategy and how attackers will seek to maintain their advantage. Understand defensive strategy, and how current approaches fail to change the strategic balance. Governments, criminals, companies, and individuals are all operating in a world without boundaries, where the laws, customs, and norms previously established over centuries are only beginning to take shape. Meanwhile computer espionage continues to grow in both frequency and impact. This book will help you mount a robust offense or a strategically sound defense against attacks and exploitation. For a clear roadmap to

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better network security, Network Attacks and Exploitation is your complete and practical guide.

Cyber Operations

What started with the sundial has, thus far, been refined to a level of precision based on atomic resonance: Time. Our obsession with time is evident in this continued scaling down to nanosecond resolution and beyond. But this obsession is not without warrant. Precision and time synchronization are critical in many applications, such as air traffic

Web Hacking

As the sophistication of cyber-attacks increases, understanding how to defend critical infrastructure systems—energy production, water, gas, and other vital systems—becomes more important, and heavily mandated. Industrial Network Security, Second Edition arms you with the knowledge you need to understand the vulnerabilities of these distributed supervisory and control systems. The book examines the unique protocols and applications that are the foundation of industrial control systems, and provides clear guidelines for their protection. This how-to guide gives you thorough understanding of the unique challenges facing

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critical infrastructures, new guidelines and security measures for critical infrastructure protection, knowledge of new and evolving security tools, and pointers on SCADA protocols and security implementation. All-new real-world examples of attacks against control systems, and more diagrams of systems Expanded coverage of protocols such as 61850, Ethernet/IP, CIP, ISA-99, and the evolution to IEC62443 Expanded coverage of Smart Grid security New coverage of signature-based detection, exploit-based vs. vulnerability-based detection, and signature reverse engineering

Securing VoIP Networks

This title shows you how to apply machine learning, statistics and data visualization as you build your own detection and intelligence system. Following an overview of basic reverse engineering concepts like static and dynamic analysis, you'll learn to measure code similarities in malware samples and use machine learning frameworks like scikit-learn and Keras to build and train your own detectors.

Getting Started with OpenBTS

The SANS Institute maintains a list of the "Top 10 Software Vulnerabilities." At the

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current time, over half of these vulnerabilities are exploitable by Buffer Overflow attacks, making this class of attack one of the most common and most dangerous weapon used by malicious attackers. This is the first book specifically aimed at detecting, exploiting, and preventing the most common and dangerous attacks. Buffer overflows make up one of the largest collections of vulnerabilities in existence; And a large percentage of possible remote exploits are of the overflow variety. Almost all of the most devastating computer attacks to hit the Internet in recent years including SQL Slammer, Blaster, and I Love You attacks. If executed properly, an overflow vulnerability will allow an attacker to run arbitrary code on the victim's machine with the equivalent rights of whichever process was overflowed. This is often used to provide a remote shell onto the victim machine, which can be used for further exploitation. A buffer overflow is an unexpected behavior that exists in certain programming languages. This book provides specific, real code examples on exploiting buffer overflow attacks from a hacker's perspective and defending against these attacks for the software developer. Over half of the "SANS TOP 10 Software Vulnerabilities" are related to buffer overflows. None of the current-best selling software security books focus exclusively on buffer overflows. This book provides specific, real code examples on exploiting buffer overflow attacks from a hacker's perspective and defending against these attacks for the software developer.

The Car Hacker's Handbook

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Penetration testers simulate cyber attacks to find security weaknesses in networks, operating systems, and applications. Information security experts worldwide use penetration techniques to evaluate enterprise defenses. In *Penetration Testing*, security expert, researcher, and trainer Georgia Weidman introduces you to the core skills and techniques that every pentester needs. Using a virtual machine-based lab that includes Kali Linux and vulnerable operating systems, you'll run through a series of practical lessons with tools like Wireshark, Nmap, and Burp Suite. As you follow along with the labs and launch attacks, you'll experience the key stages of an actual assessment—including information gathering, finding exploitable vulnerabilities, gaining access to systems, post exploitation, and more. Learn how to:

- * Crack passwords and wireless network keys with brute-forcing and wordlists
- * Test web applications for vulnerabilities
- * Use the Metasploit Framework to launch exploits and write your own Metasploit modules
- * Automate social-engineering attacks
- * Bypass antivirus software
- * Turn access to one machine into total control of the enterprise in the post exploitation phase

You'll even explore writing your own exploits. Then it's on to mobile hacking—Weidman's particular area of research—with her tool, the Smartphone Pentest Framework. With its collection of hands-on lessons that cover key tools and strategies, *Penetration Testing* is the introduction that every aspiring hacker needs.

Recent Advances in Cryptography and Network Security

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Serious Cryptography is the much anticipated review of modern cryptography by cryptographer JP Aumasson. This is a book for readers who want to understand how cryptography works in today's world. The book is suitable for a wide audience, yet is filled with mathematical concepts and meaty discussions of how the various cryptographic mechanisms work. Chapters cover the notion of secure encryption, randomness, block ciphers and ciphers, hash functions and message authentication codes, public-key crypto including RSA, Diffie-Hellman, and elliptic curves, as well as TLS and post-quantum cryptography. Numerous code examples and real use cases throughout will help practitioners to understand the core concepts behind modern cryptography, as well as how to choose the best algorithm or protocol and ask the right questions of vendors. Aumasson discusses core concepts like computational security and forward secrecy, as well as strengths and limitations of cryptographic functionalities related to

The TCP/IP Guide

Network security is not simply about building impenetrable walls—determined attackers will eventually overcome traditional defenses. The most effective computer security strategies integrate network security monitoring (NSM): the collection and analysis of data to help you detect and respond to intrusions. In *The Practice of Network Security Monitoring*, Mandiant CSO Richard Bejtlich shows you how to use NSM to add a robust layer of protection around your networks—no prior

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experience required. To help you avoid costly and inflexible solutions, he teaches you how to deploy, build, and run an NSM operation using open source software and vendor-neutral tools. You'll learn how to: -Determine where to deploy NSM platforms, and size them for the monitored networks -Deploy stand-alone or distributed NSM installations -Use command line and graphical packet analysis tools, and NSM consoles -Interpret network evidence from server-side and client-side intrusions -Integrate threat intelligence into NSM software to identify sophisticated adversaries There's no foolproof way to keep attackers out of your network. But when they get in, you'll be prepared. The Practice of Network Security Monitoring will show you how to build a security net to detect, contain, and control them. Attacks are inevitable, but losing sensitive data shouldn't be.

Metasploit

The President's life is in danger! Jimmy Sniffles, with the help of a new invention, shrinks down to miniature size to sniff out the source of the problem.

Buffer Overflow Attacks

Practical Binary Analysis is the first book of its kind to present advanced binary analysis topics in an accessible way. After an introduction on the basics of binary

formats, disassembly, and code injection, you'll dive into more complex topics such as binary instrumentation, dynamic taint analysis, and symbolic execution. By the end of the book, you'll be able to build your own binary analysis tools on Linux by following hands-on and practical examples.

Computer Network Time Synchronization

Modern cars are more computerized than ever. Infotainment and navigation systems, Wi-Fi, automatic software updates, and other innovations aim to make driving more convenient. But vehicle technologies haven't kept pace with today's more hostile security environment, leaving millions vulnerable to attack. The Car Hacker's Handbook will give you a deeper understanding of the computer systems and embedded software in modern vehicles. It begins by examining vulnerabilities and providing detailed explanations of communications over the CAN bus and between devices and systems. Then, once you have an understanding of a vehicle's communication network, you'll learn how to intercept data and perform specific hacks to track vehicles, unlock doors, glitch engines, flood communication, and more. With a focus on low-cost, open source hacking tools such as Metasploit, Wireshark, Kayak, can-utils, and ChipWhisperer, The Car Hacker's Handbook will show you how to:

- Build an accurate threat model for your vehicle
- Reverse engineer the CAN bus to fake engine signals
- Exploit vulnerabilities in diagnostic and data-logging systems
- Hack the ECU and other firmware and embedded

systems -Feed exploits through infotainment and vehicle-to-vehicle communication systems -Override factory settings with performance-tuning techniques -Build physical and virtual test benches to try out exploits safely If you're curious about automotive security and have the urge to hack a two-ton computer, make *The Car Hacker's Handbook* your first stop.

Building Internet Firewalls

There are hundreds--if not thousands--of techniques used to compromise both Windows and Unix-based systems. Malicious code and new exploit scripts are released on a daily basis, and each evolution becomes more and more sophisticated. Keeping up with the myriad of systems used by hackers in the wild is a formidable task, and scrambling to patch each potential vulnerability or address each new attack one-by-one is a bit like emptying the Atlantic with paper cup. If you're a network administrator, the pressure is on you to defend your systems from attack. But short of devoting your life to becoming a security expert, what can you do to ensure the safety of your mission critical systems? Where do you start? Using the steps laid out by professional security analysts and consultants to identify and assess risks, *Network Security Assessment* offers an efficient testing model that an administrator can adopt, refine, and reuse to create proactive defensive strategies to protect their systems from the threats that are out there, as well as those still being developed. This thorough and insightful guide covers

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offensive technologies by grouping and analyzing them at a higher level--from both an offensive and defensive standpoint--helping administrators design and deploy networks that are immune to offensive exploits, tools, and scripts. Network administrators who need to develop and implement a security assessment program will find everything they're looking for--a proven, expert-tested methodology on which to base their own comprehensive program--in this time-saving new book.

Network Security

Deploy your own private mobile network with OpenBTS, the open source software project that converts between the GSM and UMTS wireless radio interface and open IP protocols. With this hands-on, step-by-step guide, you'll learn how to use OpenBTS to construct simple, flexible, and inexpensive mobile networks with software. OpenBTS can distribute any internet connection as a mobile network across a large geographic region, and provide connectivity to remote devices in the Internet of Things. Ideal for telecom and software engineers new to this technology, this book helps you build a basic OpenBTS network with voice and SMS services and data capabilities. From there, you can create your own niche product or experimental feature. Select hardware, and set up a base operating system for your project Configure, troubleshoot, and use performance-tuning techniques Expand to a true multinode mobile network complete with Mobility and Handover

Add general packet radio service (GPRS) data connectivity, ideal for IoT devices
Build applications on top of the OpenBTS NodeManager control and event APIs

Attacking Network Protocols

Rootkits and Bootkits will teach you how to understand and counter sophisticated, advanced threats buried deep in a machine's boot process or UEFI firmware. With the aid of numerous case studies and professional research from three of the world's leading security experts, you'll trace malware development over time from rootkits like TDL3 to present-day UEFI implants and examine how they infect a system, persist through reboot, and evade security software. As you inspect and dissect real malware, you'll learn:

- How Windows boots—including 32-bit, 64-bit, and UEFI mode—and where to find vulnerabilities
- The details of boot process security mechanisms like Secure Boot, including an overview of Virtual Secure Mode (VSM) and Device Guard
- Reverse engineering and forensic techniques for analyzing real malware, including bootkits like Rovnix/Carberp, Gapz, TDL4, and the infamous rootkits TDL3 and Festi
- How to perform static and dynamic analysis using emulation and tools like Bochs and IDA Pro
- How to better understand the delivery stage of threats against BIOS and UEFI firmware in order to create detection capabilities
- How to use virtualization tools like VMware Workstation to reverse engineer bootkits and the Intel Chipsec tool to dig into forensic analysis

Cybercrime syndicates and malicious actors will continue to write ever more

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persistent and covert attacks, but the game is not lost. Explore the cutting edge of malware analysis with Rootkits and Bootkits. Covers boot processes for Windows 32-bit and 64-bit operating systems.

Gray Hat C#

Up to date and accessible, this comprehensive reference to the TCP/IP networking protocols will become a valuable resource for any IT professional and an excellent text for students.

Real-World Bug Hunting

Attacking Network Protocols is a deep dive into network protocol security from James Forshaw, one of the world's leading bug hunters. This comprehensive guide looks at networking from an attacker's perspective to help you discover, exploit, and ultimately protect vulnerabilities. You'll start with a rundown of networking basics and protocol traffic capture before moving on to static and dynamic protocol analysis, common protocol structures, cryptography, and protocol security. Then you'll turn your focus to finding and exploiting vulnerabilities, with an overview of common bug classes, fuzzing, debugging, and exhaustion attacks. Learn how to: - Capture, manipulate, and replay packets - Develop tools to dissect traffic and

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reverse engineer code to understand the inner workings of a network protocol - Discover and exploit vulnerabilities such as memory corruptions, authentication bypasses, and denials of service - Use capture and analysis tools like Wireshark and develop your own custom network proxies to manipulate network traffic Attacking Network Protocols is a must-have for any penetration tester, bug hunter, or developer looking to understand and discover network vulnerabilities.

Serious Cryptography

Identify and safeguard your network against both internal and external threats, hackers, and malware attacks About This Book Lay your hands on physical and virtual evidence to understand the sort of crime committed by capturing and analyzing network traffic Connect the dots by understanding web proxies, firewalls, and routers to close in on your suspect A hands-on guide to help you solve your case with malware forensic methods and network behaviors Who This Book Is For If you are a network administrator, system administrator, information security, or forensics professional and wish to learn network forensic to track the intrusions through network-based evidence, then this book is for you. Basic knowledge of Linux and networking concepts is expected. What You Will Learn Understand Internetworking, sources of network-based evidence and other basic technical fundamentals, including the tools that will be used throughout the book Acquire evidence using traffic acquisition software and know how to manage and handle

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the evidence Perform packet analysis by capturing and collecting data, along with content analysis Locate wireless devices, as well as capturing and analyzing wireless traffic data packets Implement protocol analysis and content matching; acquire evidence from NIDS/NIPS Act upon the data and evidence gathered by being able to connect the dots and draw links between various events Apply logging and interfaces, along with analyzing web proxies and understanding encrypted web traffic Use IOCs (Indicators of Compromise) and build real-world forensic solutions, dealing with malware In Detail We live in a highly networked world. Every digital device—phone, tablet, or computer is connected to each other, in one way or another. In this new age of connected networks, there is network crime. Network forensics is the brave new frontier of digital investigation and information security professionals to extend their abilities to catch miscreants on the network. The book starts with an introduction to the world of network forensics and investigations. You will begin by getting an understanding of how to gather both physical and virtual evidence, intercepting and analyzing network data, wireless data packets, investigating intrusions, and so on. You will further explore the technology, tools, and investigating methods using malware forensics, network tunneling, and behaviors. By the end of the book, you will gain a complete understanding of how to successfully close a case. Style and approach An easy-to-follow book filled with real-world case studies and applications. Each topic is explained along with all the practical tools and software needed, allowing the reader to use a completely hands-on approach.

The Browser Hacker's Handbook

This book constitutes the proceedings of the 19th Nordic Conference on Secure IT Systems, held in Tromsø, Norway, in October 2014. The 15 full papers presented in this volume were carefully reviewed and selected from 42 submissions. They are organized in topical sections named: information management and data privacy; cloud, big data and virtualization security; network security and logging; attacks and defenses; and security in healthcare and biometrics. The volume also contains one full-paper invited talk.

Attacking Network Protocols

What people are saying about Inside Cyber Warfare "The necessary handbook for the 21st century." --Lewis Shepherd, Chief Tech Officer and Senior Fellow, Microsoft Institute for Advanced Technology in Governments "A must-read for policy makers and leaders who need to understand the big-picture landscape of cyber war." --Jim Stogdill, CTO, Mission Services Accenture You may have heard about "cyber warfare" in the news, but do you really know what it is? This book provides fascinating and disturbing details on how nations, groups, and individuals throughout the world are using the Internet as an attack platform to gain military, political, and economic advantages over their adversaries. You'll learn how

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sophisticated hackers working on behalf of states or organized crime patiently play a high-stakes game that could target anyone, regardless of affiliation or nationality. Inside Cyber Warfare goes beyond the headlines of attention-grabbing DDoS attacks and takes a deep look inside multiple cyber-conflicts that occurred from 2002 through summer 2009. Learn how cyber attacks are waged in open conflicts, including recent hostilities between Russia and Georgia, and Israel and Palestine Discover why Twitter, Facebook, LiveJournal, Vkontakte, and other sites on the social web are mined by the intelligence services of many nations Read about China's commitment to penetrate the networks of its technologically superior adversaries as a matter of national survival Find out why many attacks originate from servers in the United States, and who's responsible Learn how hackers are "weaponizing" malware to attack vulnerabilities at the application level

Rootkits and Bootkits

Hackers exploit browser vulnerabilities to attack deep within networks The Browser Hacker's Handbook gives a practical understanding of hacking the everyday web browser and using it as a beachhead to launch further attacks deep into corporate networks. Written by a team of highly experienced computer security experts, the handbook provides hands-on tutorials exploring a range of current attack methods. The web browser has become the most popular and widely used computer "program" in the world. As the gateway to the Internet, it is part of the storefront to

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any business that operates online, but it is also one of the most vulnerable entry points of any system. With attacks on the rise, companies are increasingly employing browser-hardening techniques to protect the unique vulnerabilities inherent in all currently used browsers. The Browser Hacker's Handbook thoroughly covers complex security issues and explores relevant topics such as: Bypassing the Same Origin Policy ARP spoofing, social engineering, and phishing to access browsers DNS tunneling, attacking web applications, and proxying—all from the browser Exploiting the browser and its ecosystem (plugins and extensions) Cross-origin attacks, including Inter-protocol Communication and Exploitation The Browser Hacker's Handbook is written with a professional security engagement in mind. Leveraging browsers as pivot points into a target's network should form an integral component into any social engineering or red-team security assessment. This handbook provides a complete methodology to understand and structure your next browser penetration test.

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Like the best-selling Black Hat Python, Black Hat Go explores the darker side of the popular Go programming language. This collection of short scripts will help you test your systems, build and automate tools to fit your needs, and improve your offensive security skillset. Black Hat Go explores the darker side of Go, the popular programming language revered by hackers for its simplicity, efficiency, and

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reliability. It provides an arsenal of practical tactics from the perspective of security practitioners and hackers to help you test your systems, build and automate tools to fit your needs, and improve your offensive security skillset, all using the power of Go. You'll begin your journey with a basic overview of Go's syntax and philosophy and then start to explore examples that you can leverage for tool development, including common network protocols like HTTP, DNS, and SMB. You'll then dig into various tactics and problems that penetration testers encounter, addressing things like data pilfering, packet sniffing, and exploit development. You'll create dynamic, pluggable tools before diving into cryptography, attacking Microsoft Windows, and implementing steganography. You'll learn how to:

- Make performant tools that can be used for your own security projects
- Create usable tools that interact with remote APIs
- Scrape arbitrary HTML data
- Use Go's standard package, net/http, for building HTTP servers
- Write your own DNS server and proxy
- Use DNS tunneling to establish a C2 channel out of a restrictive network
- Create a vulnerability fuzzer to discover an application's security weaknesses
- Use plug-ins and extensions to future-proof products
- Build an RC2 symmetric-key brute-forcer
- Implant data within a Portable Network Graphics (PNG) image.

Are you ready to add to your arsenal of security tools? Then let's Go!

The InfoSec Handbook

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The classic guide to network security—now fully updated!"Bob and Alice are back!" Widely regarded as the most comprehensive yet comprehensible guide to network security, the first edition of Network Security received critical acclaim for its lucid and witty explanations of the inner workings of network security protocols. In the second edition, this most distinguished of author teams draws on hard-won experience to explain the latest developments in this field that has become so critical to our global network-dependent society. Network Security, Second Edition brings together clear, insightful, and clever explanations of every key facet of information security, from the basics to advanced cryptography and authentication, secure Web and email services, and emerging security standards. Coverage includes: All-new discussions of the Advanced Encryption Standard (AES), IPsec, SSL, and Web security Cryptography: In-depth, exceptionally clear introductions to secret and public keys, hashes, message digests, and other crucial concepts Authentication: Proving identity across networks, common attacks against authentication systems, authenticating people, and avoiding the pitfalls of authentication handshakes Core Internet security standards: Kerberos 4/5, IPsec, SSL, PKIX, and X.509 Email security: Key elements of a secure email system-plus detailed coverage of PEM, S/MIME, and PGP Web security: Security issues associated with URLs, HTTP, HTML, and cookies Security implementations in diverse platforms, including Windows, NetWare, and Lotus Notes The authors go far beyond documenting standards and technology: They contrast competing schemes, explain strengths and weaknesses, and identify the crucial errors most

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likely to compromise secure systems. Network Security will appeal to a wide range of professionals, from those who design or evaluate security systems to system administrators and programmers who want a better understanding of this important field. It can also be used as a textbook at the graduate or advanced undergraduate level.

Penetration Testing

In the five years since the first edition of this classic book was published, Internet use has exploded. The commercial world has rushed headlong into doing business on the Web, often without integrating sound security technologies and policies into their products and methods. The security risks--and the need to protect both business and personal data--have never been greater. We've updated Building Internet Firewalls to address these newer risks. What kinds of security threats does the Internet pose? Some, like password attacks and the exploiting of known security holes, have been around since the early days of networking. And others, like the distributed denial of service attacks that crippled Yahoo, E-Bay, and other major e-commerce sites in early 2000, are in current headlines. Firewalls, critical components of today's computer networks, effectively protect a system from most Internet security threats. They keep damage on one part of the network--such as eavesdropping, a worm program, or file damage--from spreading to the rest of the network. Without firewalls, network security problems can rage out of control,

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dragging more and more systems down. Like the bestselling and highly respected first edition, *Building Internet Firewalls, 2nd Edition*, is a practical and detailed step-by-step guide to designing and installing firewalls and configuring Internet services to work with a firewall. Much expanded to include Linux and Windows coverage, the second edition describes: Firewall technologies: packet filtering, proxying, network address translation, virtual private networks Architectures such as screening routers, dual-homed hosts, screened hosts, screened subnets, perimeter networks, internal firewalls Issues involved in a variety of new Internet services and protocols through a firewall Email and News Web services and scripting languages (e.g., HTTP, Java, JavaScript, ActiveX, RealAudio, RealVideo) File transfer and sharing services such as NFS, Samba Remote access services such as Telnet, the BSD "r" commands, SSH, BackOrifice 2000 Real-time conferencing services such as ICQ and talk Naming and directory services (e.g., DNS, NetBT, the Windows Browser) Authentication and auditing services (e.g., PAM, Kerberos, RADIUS); Administrative services (e.g., syslog, SNMP, SMS, RIP and other routing protocols, and ping and other network diagnostics) Intermediary protocols (e.g., RPC, SMB, CORBA, IIOP) Database protocols (e.g., ODBC, JDBC, and protocols for Oracle, Sybase, and Microsoft SQL Server) The book's complete list of resources includes the location of many publicly available firewall construction tools.

Packet Guide to Core Network Protocols

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"The Metasploit Framework makes discovering, exploiting, and sharing vulnerabilities quick and relatively painless. But while Metasploit is used by security professionals everywhere, documentation is lacking and the tool can be hard to grasp for first-time users. *Metasploit: A Penetration Tester's Guide* fills this gap by teaching you how to harness the Framework, use its many features, and interact with the vibrant community of Metasploit contributors. The authors begin by building a foundation for penetration testing and establishing a fundamental methodology. From there, they explain the Framework's conventions, interfaces, and module system, as they show you how to assess networks with Metasploit by launching simulated attacks. Having mastered the essentials, you'll move on to advanced penetration testing techniques, including network reconnaissance and enumeration, client-side attacks, devastating wireless attacks, and targeted social engineering attacks. *Metasploit: A Penetration Tester's Guide* will teach you how to:

- Find and exploit unmaintained, misconfigured, and unpatched systems
- Perform reconnaissance and find valuable information about your target
- Bypass anti-virus technologies and circumvent security controls
- Integrate Nmap, NeXpose, and Nessus with Metasploit to automate discovery
- Use the Meterpreter shell to launch further attacks from inside the network
- Harness standalone Metasploit utilities, third-party tools, and plug-ins
- Learn how to write your own Meterpreter post exploitation modules and scripts
- You'll even touch on exploit discovery for zero-day research, write a fuzzer, port existing exploits into the Framework, and learn how to cover your tracks.

Whether your goal is to make your own networks more secure

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or to put someone else's to the test, Metasploit: A Penetration Tester's Guide will take you there and beyond"--

Secure IT Systems

Protocols for authentication and key establishment are the foundation for security of communications. The range and diversity of these protocols is immense, while the properties and vulnerabilities of different protocols can vary greatly. This is the first comprehensive and integrated treatment of these protocols. It allows researchers and practitioners to quickly access a protocol for their needs and become aware of existing protocols which have been broken in the literature. As well as a clear and uniform presentation of the protocols this book includes a description of all the main attack types and classifies most protocols in terms of their properties and resource requirements. It also includes tutorial material suitable for graduate students.

Inside Cyber Warfare

James Forshaw, Microsoft's #1 bug hunter in 2015, teaches readers how to find, exploit, and ultimately protect vulnerabilities in network protocols. Attacking Network Protocols offers security professionals and developers a deeper

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understanding of network protocols, to allow them to better understand networks, protect them against attack, and find new vulnerabilities.

Seven Deadliest Network Attacks

The InfoSec Handbook offers the reader an organized layout of information that is easily read and understood. Allowing beginners to enter the field and understand the key concepts and ideas, while still keeping the experienced readers updated on topics and concepts. It is intended mainly for beginners to the field of information security, written in a way that makes it easy for them to understand the detailed content of the book. The book offers a practical and simple view of the security practices while still offering somewhat technical and detailed information relating to security. It helps the reader build a strong foundation of information, allowing them to move forward from the book with a larger knowledge base. Security is a constantly growing concern that everyone must deal with. Whether it's an average computer user or a highly skilled computer user, they are always confronted with different security risks. These risks range in danger and should always be dealt with accordingly. Unfortunately, not everyone is aware of the dangers or how to prevent them and this is where most of the issues arise in information technology (IT). When computer users do not take security into account many issues can arise from that like system compromises or loss of data and information. This is an obvious issue that is present with all computer users. This book is intended to

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educate the average and experienced user of what kinds of different security practices and standards exist. It will also cover how to manage security software and updates in order to be as protected as possible from all of the threats that they face.

Malware Data Science

Provides information on ways to use Wireshark to capture and analyze packets, covering such topics as building customized capture and display filters, graphing traffic patterns, and building statistics and reports.

Security of Networks and Services in an All-Connected World

This reference guide to creating high quality security software covers the complete suite of security applications referred to as end2end security. It illustrates basic concepts of security engineering through real-world examples.

Industrial Network Security

Network Security Assessment

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Seven Deadliest Network Attacks identifies seven classes of network attacks and discusses how the attack works, including tools to accomplish the attack, the risks of the attack, and how to defend against the attack. This book pinpoints the most dangerous hacks and exploits specific to networks, laying out the anatomy of these attacks including how to make your system more secure. You will discover the best ways to defend against these vicious hacks with step-by-step instruction and learn techniques to make your computer and network impenetrable. The book consists of seven chapters that deal with the following attacks: denial of service; war dialing; penetration testing; protocol tunneling; spanning tree attacks; man-in-the-middle; and password replay. These attacks are not mutually exclusive and were chosen because they help illustrate different aspects of network security. The principles on which they rely are unlikely to vanish any time soon, and they allow for the possibility of gaining something of interest to the attacker, from money to high-value data. This book is intended to provide practical, usable information. However, the world of network security is evolving very rapidly, and the attack that works today may (hopefully) not work tomorrow. It is more important, then, to understand the principles on which the attacks and exploits are based in order to properly plan either a network attack or a network defense. Seven Deadliest Network Attacks will appeal to information security professionals of all levels, network admins, and recreational hackers. Knowledge is power, find out about the most dominant attacks currently waging war on computers and networks globally

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Discover the best ways to defend against these vicious attacks; step-by-step instruction shows you how Institute countermeasures, don't be caught defenseless again, and learn techniques to make your computer and network impenetrable

Network Security Architectures

Learn to use C#'s powerful set of core libraries to automate tedious yet important tasks like performing vulnerability scans, malware analysis, and incident response. With some help from Mono, you can write your own practical security tools that will run on Mac, Linux, and even mobile devices. Following a crash course in C# and some of its advanced features, you'll learn how to: -Write fuzzers that use the HTTP and XML libraries to scan for SQL and XSS injection -Generate shellcode in Metasploit to create cross-platform and cross-architecture payloads -Automate Nessus, OpenVAS, and sqlmap to scan for vulnerabilities and exploit SQL injections -Write a .NET decompiler for Mac and Linux -Parse and read offline registry hives to dump system information -Automate the security tools Arachni and Metasploit using their MSGPACK RPCs Streamline and simplify your work day with Gray Hat C# and C#'s extensive repertoire of powerful tools and libraries.

Black Hat Go

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In the field of computers and with the advent of the internet, the topic of secure communication has gained significant importance. The theory of cryptography and coding theory has evolved to handle many such problems. The emphases of these topics are both on secure communication that uses encryption and decryption schemes as well as on user authentication for the purpose of non-repudiation. Subsequently, the topics of distributed and cloud computing have emerged. Existing results related to cryptography and network security had to be tuned to adapt to these new technologies. With the more recent advancement of mobile technologies and IOT (internet of things), these algorithms had to take into consideration the limited resources such as battery power, storage and processor capabilities. This has led to the development of lightweight cryptography for resource constrained devices. The topic of network security also had to face many challenges owing to variable interconnection topology instead of a fixed interconnection topology. For this reason, the system is susceptible to various attacks from eavesdroppers. This book addresses these issues that arise in present day computing environments and helps the reader to overcome these security threats.

Protocols for Authentication and Key Establishment

The definitive guide to hacking the world of the Internet of Things (IoT) -- Internet connected devices such as medical devices, home assistants, smart home

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appliances and more. Geared towards security researchers, IT teams, and penetration testers, application testers, developers, and IT administrators, this book teaches readers how to get started with hacking Internet connected devices. Readers dig deep into technical (and related legal) issues, as they learn what kinds of devices to use as hacking tools and which make the best targets. The authors, all experts in the field, cover the kinds of vulnerabilities found in IoT devices, explain how to exploit their network protocols, and how to leverage security flaws and certain hardware interfaces found in the physical devices themselves. The book begins with threat modeling and a security testing methodology, then covers how to attack hardware interfaces such as UART, I C, SPI, JTAG / SWD and IoT network protocols like UPnP, WS-Discovery, mDNS, DNS-SD, RTSP / RTCP / RTP, LoRa / LoRaWAN, Wi-Fi / Wi-Fi Direct, RFID / NFC, BLE, MQTT, CDP and DICOM. Examples throughout offer custom code designed to demonstrate specific vulnerabilities and tools to help readers reproduce the attacks. Practical IoT Hacking is full of practical exercises and hands-on examples taken from the authors' own research that teach readers things like how to bypass the authentication of an STM32F103 device (black pill) through SWD; reverse firmware; exploit zero-configuration networking; use low-cost equipment to capture LoRa network traffic; analyze IoT companion mobile apps, take over and remotely control an Android based treadmill, jam wireless devices such as home alarm systems, hijack Bluetooth Low Energy connections and how to circumvent modern RFID and NFC enabled smart door locks.

Learning Network Forensics

Cyber Operations walks you through all the processes to set up, defend, and attack computer networks. This book focuses on networks and real attacks, offers extensive coverage of offensive and defensive techniques, and is supported by a rich collection of exercises and resources. You'll learn how to configure your network from the ground up, starting by setting up your virtual test environment with basics like DNS and active directory, through common network services, and ending with complex web applications involving web servers and backend databases. Key defensive techniques are integrated throughout the exposition. You will develop situational awareness of your network and will build a complete defensive infrastructure—including log servers, network firewalls, web application firewalls, and intrusion detection systems. Of course, you cannot truly understand how to defend a network if you do not know how to attack it, so you will attack your test systems in a variety of ways beginning with elementary attacks against browsers and culminating with a case study of the compromise of a defended e-commerce site. The author, who has coached his university's cyber defense team three times to the finals of the National Collegiate Cyber Defense Competition, provides a practical, hands-on approach to cyber security.

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