
Malware Analysis Training

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Learn Ethical Hacking from Scratch "O'Reilly Media, Inc."

Malware Data Science explains how to identify, analyze, and classify large-scale malware using machine learning and data visualization. Security has become a "big data" problem. The growth rate of malware has accelerated to tens of millions of new files per year while our networks generate an ever-larger flood of security-relevant data each day. In order to defend against these advanced attacks, you'll need to know how to think like a data scientist. In *Malware Data Science*, security data scientist Joshua Saxe introduces machine learning, statistics, social network analysis, and data visualization, and shows you how to apply these methods to malware detection and

analysis. You'll learn how to: - Analyze malware using static analysis - Observe malware behavior using dynamic analysis - Identify adversary groups through shared code analysis - Catch 0-day vulnerabilities by building your own machine learning detector - Measure malware detector accuracy - Identify malware campaigns, trends, and relationships through data visualization Whether you're a malware analyst looking to add skills to your existing arsenal, or a data scientist interested in attack detection and threat intelligence, *Malware Data Science* will help you stay ahead of the curve. [Antivirus Bypass Techniques](#) John Wiley & Sons This edited book presents scientific results of the 21st ACIS International Winter Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing (SNPD2021-Winter) which was held on January 28-30, at Ho Chi Minh City, Vietnam. The aim of this conference was to bring together researchers and scientists, businessmen and entrepreneurs, teachers, engineers, computer users, and students to discuss the numerous fields of computer science and to share their experiences and exchange new

ideas and information in a meaningful way and research results about all aspects (theory, applications, and tools) of computer and information science, and to discuss the practical challenges encountered along the way and the solutions adopted to solve them. The conference organizers selected the best papers from those papers accepted for presentation at the conference. The papers were chosen based on review scores submitted by members of the program committee and underwent further rigorous rounds of review. From this second round of review, 18 of most promising papers are then published in this Springer (SCI) book and not the conference proceedings. We impatiently await the important contributions that we know these authors will bring to the field of computer and information science.

Classification Methods for Internet Applications Packt Publishing Ltd

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 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.

Malware Analyst's Cookbook and DVD Springer Nature

This book is focused on the use of deep learning (DL) and artificial intelligence (AI) as tools to advance the fields of malware detection and analysis. The individual chapters of the book deal with a wide variety of state-of-the-art AI and DL techniques, which are applied to a number of challenging malware-related problems. DL and AI based approaches to malware detection and analysis are largely data driven and hence minimal expert domain knowledge of malware is needed. This book fills a gap between the emerging fields of DL/AI and malware analysis. It covers a broad range of modern and practical DL and AI techniques, including frameworks and development tools enabling the audience to innovate with cutting-edge research advancements in a multitude of malware (and closely related) use cases.

Malware Analysis Using Artificial Intelligence and Deep Learning No Starch Press

Unlike other books, courses and training that expect an analyst to piece together individual instructions into a cohesive investigation, *Investigating Windows Systems* provides a walk-through of the analysis process, with descriptions of the thought process and analysis decisions along the way. *Investigating Windows Systems* will not address topics which have been covered in other books, but will

expect the reader to have some ability to discover the detailed usage of tools and to perform their own research. The focus of this volume is to provide a walk-through of the analysis process, with descriptions of the thought process and the analysis decisions made along the way. A must-have guide for those in the field of digital forensic analysis and incident response. Provides the reader with a detailed walk-through of the analysis process, with decision points along the way, assisting the user in understanding the resulting data Coverage will include malware detection, user activity, and how to set up a testing environment Written at a beginner to intermediate level for anyone engaging in the field of digital forensic analysis and incident response

Mac OS X and iOS Internals Packt Publishing Ltd

No source code? No problem. With IDA Pro, the interactive disassembler, you live in a source code-optional world. IDA can automatically analyze the millions of opcodes that make up an executable and present you with a disassembly. But at that point, your work is just beginning. With *The IDA Pro Book*, you'll learn how to turn that mountain of mnemonics into something you can actually use. Hailed by the creator of IDA Pro as "profound, comprehensive, and accurate," the second edition of *The IDA Pro Book* covers everything from the very first steps to advanced automation techniques. You'll find complete coverage of IDA's new Qt-based user interface, as well as increased coverage of the IDA debugger, the Bochs debugger, and IDA scripting (especially using IDAPython). But because humans are still smarter than computers, you'll even learn how to use IDA's latest interactive and scriptable interfaces to your advantage. Save time and effort as you learn to:

- Navigate, comment, and modify disassembly
- Identify known library routines, so you can focus your analysis on other areas of the code
- Use code graphing to quickly make sense of cross references

- Extend IDA to support new processors and filetypes using the SDK
- Explore popular plug-ins that make writing IDA scripts easier, allow collaborative reverse engineering, and much more
- Use IDA's built-in debugger to tackle hostile and obfuscated code

Whether you're analyzing malware, conducting vulnerability research, or reverse engineering software, a mastery of IDA is crucial to your success. Take your skills to the next level with this 2nd edition of *The IDA Pro Book*.

Learning Malware Analysis McGraw Hill Professional

Understand malware analysis and its practical implementation Key Features Explore the key concepts of malware analysis and memory forensics using real-world examples Learn the art of detecting, analyzing, and investigating malware threats Understand adversary tactics and techniques Book Description Malware analysis and memory forensics are powerful analysis and investigation techniques used in reverse engineering, digital forensics, and incident response. With adversaries becoming sophisticated and carrying out advanced malware attacks on critical infrastructures, data centers, and private and public organizations, detecting, responding to, and investigating such intrusions is critical to information security professionals. Malware analysis and memory forensics have become must-have skills to fight advanced malware, targeted attacks, and security breaches. This book teaches you the concepts, techniques, and tools to understand the behavior and characteristics of malware through malware analysis. It also teaches you techniques to investigate and hunt malware using memory forensics. This book introduces you to the basics of malware analysis, and then gradually progresses into the more advanced concepts of code analysis and memory forensics. It uses real-world malware samples, infected memory images, and visual diagrams to help you gain a better understanding of the subject

and to equip you with the skills required to analyze, investigate, and respond to malware-related incidents. What you will learn

- Create a safe and isolated lab environment for malware analysis
- Extract the metadata associated with malware
- Determine malware's interaction with the system
- Perform code analysis using IDA Pro and x64dbg
- Reverse-engineer various malware functionalities
- Reverse engineer and decode common encoding/encryption algorithms
- Reverse-engineer malware code injection and hooking techniques
- Investigate and hunt malware using memory forensics

Who this book is for: This book is for incident responders, cybersecurity investigators, system administrators, malware analyst, forensic practitioners, student, or curious security professionals interested in learning malware analysis and memory forensics. Knowledge of programming languages such as C and Python is helpful but is not mandatory. If you have written few lines of code and have a basic understanding of programming concepts, you ' ll be able to get most out of this book.

cybersecurity landscape, focusing on cyber threats, malware, and more. You will learn how to collect leads to research antivirus and explore the two common bypass approaches used by the authors. Once you've covered the essentials of antivirus research and bypassing, you'll get hands-on with bypassing antivirus software using obfuscation, encryption, packing, PowerShell, and more. Toward the end, the book covers security improvement recommendations, useful for both antivirus vendors as well as for developers to help strengthen the security and malware detection capabilities of antivirus software. By the end of this security book, you'll have a better understanding of antivirus software and be able to confidently bypass antivirus software. What You Will Learn: Explore the security landscape and get to grips with the fundamentals of antivirus software Discover how to gather AV bypass research leads using malware analysis tools Understand the two commonly used antivirus bypass approaches Find out how to bypass static and dynamic antivirus engines Understand and implement bypass techniques in real-world scenarios Leverage best practices and recommendations for implementing antivirus solutions Who this book is for: This book is for security researchers, malware analysts, reverse engineers, pentesters, antivirus vendors looking to strengthen their detection capabilities, antivirus users and companies that want to test and evaluate their antivirus software, organizations that want to test and evaluate antivirus software before purchase or acquisition, and tech-savvy individuals who want to learn new topics.

The IDA Pro Book, 2nd Edition John Wiley & Sons

Learn effective malware analysis tactics to prevent your systems from getting infected Key Features Investigate cyberattacks and prevent

malware-related incidents from occurring in the future Learn core concepts of static and dynamic malware analysis, memory forensics, decryption, and much more Get practical guidance in developing efficient solutions to handle malware incidents Book Description New and developing technologies inevitably bring new types of malware with them, creating a huge demand for IT professionals that can keep malware at bay. With the help of this updated second edition of *Mastering Malware Analysis*, you'll be able to add valuable reverse-engineering skills to your CV and learn how to protect organizations in the most efficient way. This book will familiarize you with multiple universal patterns behind different malicious software types and teach you how to analyze them using a variety of approaches. You'll learn how to examine malware code and determine the damage it can possibly cause to systems, along with ensuring that the right prevention or remediation steps are followed. As you cover all aspects of malware analysis for Windows, Linux, macOS, and mobile platforms in detail, you'll also get to grips with obfuscation, anti-debugging, and other advanced anti-reverse-engineering techniques. The skills you acquire in this cybersecurity book will help you deal with all types of modern malware, strengthen your defenses, and prevent or promptly mitigate breaches regardless of the platforms involved. By the end of this book, you will have learned how to efficiently analyze samples, investigate suspicious activity, and build innovative solutions to handle malware incidents. What you will learn Explore assembly languages to strengthen your reverse-engineering skills Master various file formats and relevant APIs used by attackers Discover attack vectors and start handling IT, OT, and IoT malware Understand how to analyze samples for x86

and various RISC architectures Perform static and dynamic analysis of files of various types Get to grips with handling sophisticated malware cases Understand real advanced attacks, covering all their stages Focus on how to bypass anti-reverse-engineering techniques Who this book is for If you are a malware researcher, forensic analyst, IT security administrator, or anyone looking to secure against malicious software or investigate malicious code, this book is for you. This new edition is suited to all levels of knowledge, including complete beginners. Any prior exposure to programming or cybersecurity will further help to speed up your learning process.

Android Malware and Analysis Packt Publishing Ltd

If you 're involved in cybersecurity as a software developer, forensic investigator, or network administrator, this practical guide shows you how to apply the scientific method when assessing techniques for protecting your information systems. You 'll learn how to conduct scientific experiments on everyday tools and procedures, whether you 're evaluating corporate security systems, testing your own security product, or looking for bugs in a mobile game. Once author Josiah Dykstra gets you up to speed on the scientific method, he helps you focus on standalone, domain-specific topics, such as cryptography, malware analysis, and system security engineering. The latter chapters include practical case studies that demonstrate how to use available tools to conduct domain-specific scientific experiments. Learn the steps necessary to conduct scientific experiments in cybersecurity Explore fuzzing to test how your software handles various inputs Measure the performance of the Snort intrusion detection system Locate malicious "needles in a haystack" in your network and IT environment Evaluate

cryptography design and application in IoT products Conduct an experiment to identify relationships between similar malware binaries Understand system-level security requirements for enterprise networks and web services

Certified Ethical Hacker Complete Training Guide with Practice Questions & Labs: Springer Nature

A one-of-a-kind guide to setting up a malware research lab, using cutting-edge analysis tools, and reporting the findings Advanced Malware Analysis is a critical resource for every information security professional's anti-malware arsenal. The proven troubleshooting techniques will give an edge to information security professionals whose job involves detecting, decoding, and reporting on malware. After explaining malware architecture and how it operates, the book describes how to create and configure a state-of-the-art malware research lab and gather samples for analysis. Then, you ' ll learn how to use dozens of malware analysis tools, organize data, and create metrics-rich reports. A crucial tool for combatting malware—which currently hits each second globally Filled with undocumented methods for customizing dozens of analysis software tools for very specific uses Leads you through a malware blueprint first, then lab setup, and finally analysis and reporting activities Every tool explained in this book is available in every country around the world Malware Data Science Packt Publishing Ltd

Discover how the internals of malware work and how you can analyze and detect it. You will learn not only how to analyze and reverse malware, but also how to classify and categorize it, giving you insight into the intent of the malware. Malware Analysis and Detection Engineering is a one-stop guide to malware analysis that simplifies the topic by teaching you

undocumented tricks used by analysts in the industry. You will be able to extend your expertise to analyze and reverse the challenges that malicious software throws at you. The book starts with an introduction to malware analysis and reverse engineering to provide insight on the different types of malware and also the terminology used in the anti-malware industry. You will know how to set up an isolated lab environment to safely execute and analyze malware. You will learn about malware packing, code injection, and process hollowing plus how to analyze, reverse, classify, and categorize malware using static and dynamic tools. You will be able to automate your malware analysis process by exploring detection tools to modify and trace malware programs, including sandboxes, IDS/IPS, anti-virus, and Windows binary instrumentation. The book provides comprehensive content in combination with hands-on exercises to help you dig into the details of malware dissection, giving you the confidence to tackle malware that enters your environment. What You Will Learn Analyze, dissect, reverse engineer, and classify malware Effectively handle malware with custom packers and compilers Unpack complex malware to locate vital malware components and decipher their intent Use various static and dynamic malware analysis tools Leverage the internals of various detection engineering tools to improve your workflow Write Snort rules and learn to use them with Suricata IDS Who This Book Is For Security professionals, malware analysts, SOC analysts, incident responders, detection engineers, reverse engineers, and network security engineers "This book is a beast! If you're looking to master the ever-widening field of malware analysis, look no further. This is the definitive guide for you." Pedram Amini, CTO Inquest; Founder OpenRCE.org and ZeroDayInitiative Malware Analysis Techniques Springer Nature Master the fundamentals of malware analysis for the Windows platform and enhance your anti-malware skill set About This Book Set the baseline towards performing malware analysis on the Windows platform and how to use the tools

required to deal with malware Understand how to decipher x86 assembly code from source code inside your favourite development environment A step-by-step based guide that reveals malware analysis from an industry insider and demystifies the process Who This Book Is For This book is best for someone who has prior experience with reverse engineering Windows executables and wants to specialize in malware analysis. The book presents the malware analysis thought process using a show-and-tell approach, and the examples included will give any analyst confidence in how to approach this task on their own the next time around. What You Will Learn Use the positional number system for clear conception of Boolean algebra, that applies to malware research purposes Get introduced to static and dynamic analysis methodologies and build your own malware lab Analyse destructive malware samples from the real world (ITW) from fingerprinting and static/dynamic analysis to the final debrief Understand different modes of linking and how to compile your own libraries from assembly code and integrate the code in your final program Get to know about the various emulators, debuggers and their features, and sandboxes and set them up effectively depending on the required scenario Deal with other malware vectors such as pdf and MS-Office based malware as well as scripts and shellcode In Detail Windows OS is the most used operating system in the world and hence is targeted by malware writers. There are strong ramifications if things go awry. Things will go wrong if they can, and hence we see a salvo of attacks that have continued to disrupt the normal scheme of things in our day to day lives. This book will guide you on how to use essential tools such as debuggers, disassemblers, and sandboxes to dissect malware samples. It will expose your innards and then build a report of their indicators of compromise along with detection rule sets that will enable you to help contain the outbreak when faced with such a situation. We will start with the basics of computing fundamentals such as number systems and Boolean algebra. Further, you'll learn about x86 assembly programming and its integration with high level languages such as C++. You'll understand how to decipher disassembly code obtained from the compiled source code and map it back to its original design goals. By delving into end to end analysis with real-world malware samples to solidify your understanding, you'll sharpen your technique of handling destructive malware

binaries and vector mechanisms. You will also be encouraged to consider analysis lab safety measures so that there is no infection in the process. Finally, we'll have a rounded tour of various emulations, sandboxing, and debugging options so that you know what is at your disposal when you need a specific kind of weapon in order to nullify the malware. Style and approach An easy to follow, hands-on guide with descriptions and screenshots that will help you execute effective malicious software investigations and conjure up solutions creatively and confidently.

International Symposium on Distributed Computing and Artificial Intelligence Packt Publishing Ltd

Master malware analysis to protect your systems from getting infected Key Features Set up and model solutions, investigate malware, and prevent it from occurring in future Learn core concepts of dynamic malware analysis, memory forensics, decryption, and much more A practical guide to developing innovative solutions to numerous malware incidents Book Description With the ever-growing proliferation of technology, the risk of encountering malicious code or malware has also increased. Malware analysis has become one of the most trending topics in businesses in recent years due to multiple prominent ransomware attacks. Mastering Malware Analysis explains the universal patterns behind different malicious software types and how to analyze them using a variety of approaches. You will learn how to examine malware code and determine the damage it can possibly cause to your systems to ensure that it won't propagate any further. Moving forward, you will cover all aspects of malware analysis for the Windows platform in detail. Next, you will get to grips with obfuscation and anti-disassembly, anti-debugging, as well as anti-virtual machine techniques. This book will help you deal with modern cross-platform malware. Throughout the course of this book, you will explore real-world examples of static and dynamic malware analysis, unpacking and decrypting, and rootkit detection. Finally, this book will help you strengthen your defenses and prevent malware

breaches for IoT devices and mobile platforms. By the end of this book, you will have learned to effectively analyze, investigate, and build innovative solutions to handle any malware incidents. What you will learn

Explore widely used assembly languages to strengthen your reverse-engineering skills

Master different executable file formats, programming languages, and relevant APIs used by attackers

Perform static and dynamic analysis for multiple platforms and file types

Get to grips with handling sophisticated malware cases

Understand real advanced attacks, covering all stages from infiltration to hacking the system

Learn to bypass anti-reverse engineering techniques

Who this book is for

If you are an IT security administrator, forensic analyst, or malware researcher looking to secure against malicious software or investigate malicious code, this book is for you. Prior programming experience and a fair understanding of malware attacks and investigation is expected.

determine the root cause of a security incident

Learn to integrate digital forensic techniques and procedures into the overall incident response process

Integrate threat intelligence in digital evidence analysis

Prepare written documentation for use internally or with external parties such as regulators or law enforcement agencies

In Detail

Digital Forensics and Incident Response will guide you through the entire spectrum of tasks associated with incident response, starting with preparatory activities associated with creating an incident response plan and creating a digital forensics capability within your own organization. You will then begin a detailed examination of digital forensic techniques including acquiring evidence, examining volatile memory, hard drive assessment, and network-based evidence. You will also explore the role that threat intelligence plays in the incident response process. Finally, a detailed section on preparing reports will help you prepare a written report for use either internally or in a courtroom. By the end of the book, you will have mastered forensic techniques and incident response and you will have a solid foundation on which to increase your ability to investigate such incidents in your organization.

Style and approach

The book covers practical scenarios and examples in an enterprise setting to give you an understanding of how digital forensics integrates with the overall response to cyber security incidents. You will also learn the proper use of tools and techniques to investigate common cyber security incidents such as malware infestation, memory analysis, disk analysis, and network analysis.

Practical Packet Analysis John Wiley & Sons

An in-depth look into Mac OS X and iOS kernels

Powering Macs, iPhones, iPads and more, OS X and iOS are becoming ubiquitous. When it comes to documentation, however, much of them are shrouded in mystery. Cocoa and Carbon, the application frameworks, are neatly described, but system programmers find the

Reversing CRC Press

Practical Malware Analysis No Starch Press

Investigating Windows Systems No Starch Press

A practical guide to deploying digital forensic techniques in response to cyber security incidents

About This Book

Learn incident response fundamentals and create an effective incident response framework

Master forensics investigation utilizing digital investigative techniques

Contains real-life scenarios that effectively use threat intelligence and modeling techniques

Who This Book Is For

This book is targeted at Information Security professionals, forensics practitioners, and students with knowledge and experience in the use of software applications and basic command-line experience. It will also help professionals who are new to the incident response/digital forensics role within their organization.

What You Will Learn

Create and deploy incident response capabilities within your organization

Build a solid foundation for acquiring and handling suitable evidence for later analysis

Analyze collected evidence and

rest lacking. This indispensable guide illuminates the darkest corners of those systems, starting with an architectural overview, then drilling all the way to the core. Provides you with a top down view of OS X and iOS Walks you through the phases of system startup—both Mac (Efi) and mobile (iBoot) Explains how processes, threads, virtual memory, and filesystems are maintained Covers the security architecture Reviews the internal Apis used by the system—BSD and Mach Dissects the kernel, XNU, into its sub components: Mach, the BSD Layer, and I/o kit, and explains each in detail Explains the inner workings of device drivers From architecture to implementation, this book is essential reading if you want to get serious about the internal workings of Mac OS X and iOS.

The Art of Memory Forensics CRC Press

This book is a step-by-step, practical tutorial for analyzing and detecting malware and performing digital investigations. This book features clear and concise guidance in an easily accessible format. Cuckoo Malware Analysis is great for anyone who wants to analyze malware through programming, networking, disassembling, forensics, and virtualization. Whether you are new to malware analysis or have some experience, this book will help you get started with Cuckoo Sandbox so you can start analysing malware effectively and efficiently.

Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing John Wiley & Sons

The rapid growth and development of Android-based devices has resulted in a wealth of sensitive information on mobile devices that offer minimal malware protection. This has created an immediate need for security professionals that understand how to best approach the subject of Android malware threats and analysis. In Android Malware and Analysis, K

Practical Reverse Engineering No Starch Press

Analyzing how hacks are done, so as to stop them in the future Reverse engineering is the process of analyzing hardware or software and understanding it, without having access to the source code or design documents. Hackers are able to reverse engineer systems and exploit what they find with scary results. Now the goodguys can use the same tools to thwart these threats. Practical Reverse Engineering goes under the hood of reverse engineering for security analysts, security engineers, and system programmers, so they can learn how to use these same processes to stop hackers in their tracks. The book covers x86, x64, and ARM (the first book to cover all three); Windows kernel-mode code rootkits and drivers; virtual machine protection techniques; and much more. Best of all, it offers a systematic approach to the material, with plenty of hands-on exercises and real-world examples. Offers a systematic approach to understanding reverse engineering, with hands-on exercises and real-world examples Covers x86, x64, and advanced RISC machine (ARM) architectures as well as deobfuscation and virtual machine protection techniques Provides special coverage of Windows kernel-mode code (rootkits/drivers), a topic not often covered elsewhere, and explains how to analyze drivers step by step Demystifies topics that have a steep learning curve Includes a bonus chapter on reverse engineering tools Practical Reverse Engineering: Using x86, x64, ARM, Windows Kernel, and Reversing Tools provides crucial, up-to-date guidance for a broad range of IT professionals.