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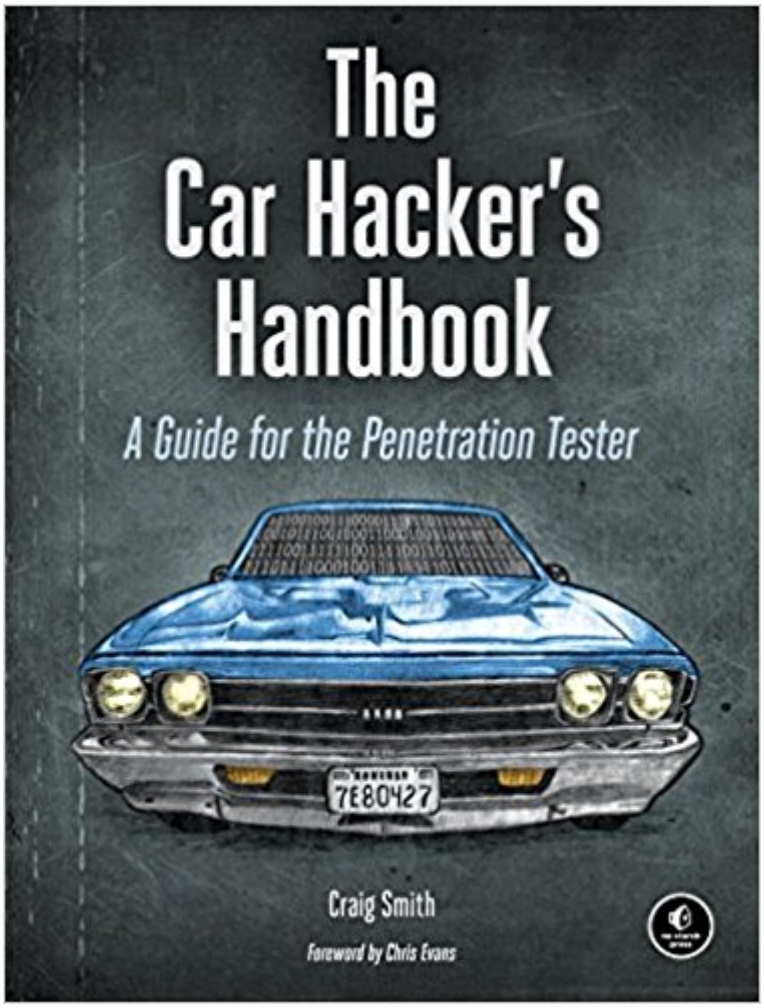
The Car Hacker's Handbook: A Guide For The Penetration Tester



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Synopsis

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 havenÃ¢â ¬â„¢t kept pace with todayÃ¢â ¬â„¢s more hostile security environment, leaving millions vulnerable to attack.The Car HackerÃ¢â ¬â„¢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 vehicleÃ¢â ¬â„¢s communication network, youÃ¢â ¬â„¢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 HackerÃ¢â ¬â„¢s Handbook will show you how to:Ã¢â ¬â œBuild an accurate threat model for your vehicleÃ¢â ¬â œReverse engineer the CAN bus to fake engine signalsÃ¢â ¬â œExploit vulnerabilities in diagnostic and data-logging systemsÃ¢â ¬â œHack the ECU and other firmware and embedded systemsÃ¢â ¬â œFeed exploits through infotainment and vehicle-to-vehicle communication systemsÃ¢â ¬â œOverride factory settings with performance-tuning techniquesÃ¢â ¬â œBuild physical and virtual test benches to try out exploits safelyIf youÃ¢â ¬â„¢re curious about automotive security and have the urge to hack a two-ton computer, make The Car HackerÃ¢â ¬â„¢s Handbook your first stop.

Book Information

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Customer Reviews

Craig Smith runs Theia Labs, a research firm that focuses on security auditing and building hardware and software prototypes. He has worked for several auto manufacturers and provided them with his public research. He is also a founder of the Hive13 hackerspace and OpenGarages.org. Craig is a frequent speaker on car hacking and has run workshops at RSA, DEF CON, and other major security conferences

Craig is a brilliant man. This book is a fantastic guide

The history of technology is replete with instances of security researchers finding a flaw in a product. The vendors then discount the issue and mock the findings; saying itÃƒÂ¢Ã â ¬Ã â„¢s only a theoretical vulnerability. They may even resort to suing the researchers. When the vulnerability becomes widespread, these vendors then run to patch their insecure product.We are in that situation now with vulnerabilities around automobile systems. While researchers have been sued and their findings removed from public view, itÃƒÂ¢Ã â ¬Ã â„¢s only a matter of time until there will be widespread hacks against car systems.In the just released The Car Hacker's Handbook: A Guide for the Penetration Tester, author Craig Smith has written a fascinating book about how connected cars work, and how they can be hacked. The book provides a substantial amount of information about the applications and embedded software that runs the vehicle.If conference titles are any sort of indicator of the importance of an issue, the recent 2016 RSA Security conference shows the importance of automobile security. The following presentations around auto security were given:ÃƒÂ¢Ã â ¬Ã Â¢ Collision Investigator: Aftermath of the Auto Hacks (given by author Craig Smith)ÃƒÂ¢Ã â ¬Ã Â¢ Braking the Connected Car: The Future of Vehicle VulnerabilitiesÃƒÂ¢Ã â ¬Ã Â¢ Do We Need Cyber-Ratings for the Auto Industry?ÃƒÂ¢Ã â ¬Ã Â¢ Automobiles are Getting Hacked: WhatÃƒÂ¢Ã â ¬Ã â„¢s Next for Transportation Security?Adding to the issue is that last week the FBI issued a public service announcement that motor vehicles are increasingly vulnerable to remote exploits. Last week also saw a Tesla Model S hacking keynote during the CeBIT conference.This is a truly fascinating book showing how connected cars are vulnerable due to poorly written software. As new cars are highly computerized; the underlying security is only as good as it is designed and implemented. Based on that, Smith shows how we are far from that state of secure design and implementation. As detailed in the book, some cars can be hacked with ease. In chapter 9, Smith notes that it is often easy to modify the software as the vendors provide no defense against an attack.Smith writes that early car

systems often had proprietary software systems that made hacking harder. With many manufactures moving to open systems due to cost savings; many of the initial challenges have been obviated. Newer cars now use Ethernet, VoIP and other open standards and protocols.At the end of the day, anything with connectivity and software can be hacked. Cars have a lot of software and each year with added functionality and more lines of code, the risks increase.While the book focuses on new cars, older cars can still be network via aftermarket additions. So itÃƒÂ¢Ã â ¬Ã â„¢s not so farfetched that an Edsel could be hacked.The book is an outgrowth of Car Hacker's Handbook from the Open Garages project, of which Smith is the founder. Open Garages are Vehicle Research Labs (VRL) centered around understanding the increasingly complex vehicle systems and provides public access, documentation and tools necessary to understand today's modern vehicle systems.The book provides the reader with a detailed overview of the computer systems and embedded software ubiquitous in todayÃƒÂ¢Ã â ¬Ã â„¢s new cars. Smith details that vehicles have numerous entry points where a hack can occur. From the CAN, infotainment system, engine control unit (ECU) and more.Smith knows the topic eminently well and the book is a fascinating read. This is a highly technical book. Those with coding experience will find the most value in the book.In Chapter 1, Smith provides a good overview of the many threats that cars face. He writes of the importance of threat modeling when attempting to design a secure car system. A good reference he does not mention which lends itself quite well to the topic is the definitive guide on the topic, Adam ShostackÃƒÂ¢Ã â ¬Ã â„¢s Threat Modeling: Designing for Security.The early chapters provide a significant amount of technical information around the controller area network (CAN) bus. This is a message-based protocol vehicle bus standard, designed to allow microcontrollers and devices to communicate with each other in applications without a host computer.Smith provides a number of ways that one can review engineer the CAN bus and send fake signals to the systems or engine. While not trivial, these do take programming expertise. But nonetheless, there are far from theoretical.As history repeats itself, most of the auto manufacturers are focusing more on usability than security. When alerted to the security issues, they will often reply with a generic response that they take security seriously and are continually working to improve the security of their vehicles, including their proprietary vehicle software, as they develop and incorporate even more advanced electronic features into their vehicles. Within that doublespeak is often denial of the bigger pictures. That is the scenario that book addresses.50 years ago, Ralph Nader wrote Unsafe at Any Speed: The Designed-In Dangers of the American Automobile showing how car manufacturers didnÃƒÂ¢Ã â ¬Ã â„¢t put in safety features that were available at the time, and were quite resistant to spending money on improving safety.Today the

situation is the same when it comes to car software. NaderÃƒÂ¢Ã â ¬Ã â„¢s book was a wakeup call and itÃƒÂ¢Ã â ¬Ã â„¢s hoped that The Car Hacker's Handbook: A Guide for the Penetration Tester will do that same. For those that want to understand what goes on under the hood of the car from a software perspective, this is a most worthwhile read.

Great read

Great book that provides detailed methods.

Good information, what we needed.

Tons of useful info!

very interesting book!

Nice reference material

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