
Openwrt Development Guide

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Embedded Software for the IoT Springer

An annotated guide to program and develop GNU/Linux Embedded systems quickly About This Book Rapidly design and build powerful prototypes for GNU/Linux Embedded systems Become familiar with the workings of GNU/Linux Embedded systems and how to manage its peripherals Write, monitor, and configure applications quickly and effectively, manage an external micro-controller, and use it as co-processor for real-time tasks Who This Book Is For This book targets Embedded System developers and GNU/Linux programmers who would like to program Embedded Systems and perform Embedded development. The book focuses on quick and efficient prototype building. Some experience with hardware and Embedded Systems is assumed, as is having done some previous work on GNU/Linux systems. Knowledge of scripting on GNU/Linux is expected as well. What You Will Learn Use embedded systems to implement your projects Access and manage peripherals for embedded systems Program embedded systems using languages such as C, Python, Bash, and PHP Use a complete distribution, such as Debian or Ubuntu, or an embedded one, such as OpenWrt or Yocto Harness device driver capabilities to optimize device communications Access data through several kinds of devices such as GPIO's, serial ports, PWM, ADC, Ethernet, WiFi, audio, video, I2C, SPI, One Wire, USB and CAN Practical example usage of several devices such as RFID readers, Smart card readers, barcode readers, z-Wave devices,

GSM/GPRS modems Usage of several sensors such as light, pressure, moisture, temperature, infrared, power, motion In Detail Embedded computers have become very complex in the last few years and developers need to easily manage them by focusing on how to solve a problem without wasting time in finding supported peripherals or learning how to manage them. The main challenge with experienced embedded programmers and engineers is really how long it takes to turn an idea into reality, and we show you exactly how to do it. This book shows how to interact with external environments through specific peripherals used in the industry. We will use the latest Linux kernel release 4.4.x and Debian/Ubuntu distributions (with embedded distributions like OpenWrt and Yocto). The book will present popular boards in the industry that are user-friendly to base the rest of the projects on - BeagleBone Black, SAMA5D3 Xplained, Wandboard and system-on-chip manufacturers. Readers will be able to take their first steps in programming the embedded platforms, using C, Bash, and Python/PHP languages in order to get access to the external peripherals. More about using and programming device driver and accessing the peripherals will be covered to lay a strong foundation. The readers will learn how to read/write data from/to the external environment by using both C programs or a scripting language (Bash/PHP/Python) and how to configure a device driver for a specific hardware. After finishing this book, the readers will be able to gain a good knowledge level and understanding of writing, configuring, and managing drivers, controlling and monitoring applications with the help of efficient/quick programming and will be able to apply these skills into real-world projects. Style and approach This practical tutorial will get you quickly prototyping embedded systems on GNU/Linux. This book uses a variety of hardware to program the peripherals and build simple prototypes.

The Definitive Guide to Attacking the Internet of Things Morgan Kaufmann

State-of-the-art, flat structures called metasurfaces can filter and steer light and sound, render an object completely invisible to electromagnetic waves, and much more. They can deliver automation, remote operation, and advanced performance to a wide variety of existing systems, with applications in communications, medical imaging, sensing, and security. However, for non-specialists, individual metasurfaces are currently restricted to limited reusability and accessibility. This book brings together various scientific disciplines with the aim of outlining a programmable 'plug-and-play' metasurface. The book focuses on a recently proposed platform - known as the HyperSurface - that provides many electromagnetic functions of metasurfaces in a single structure, which can be controlled and reconfigured by software. This revolutionary approach paves the way for new opportunities in wireless communications and programmable wireless environments: HyperSurfaces could link networks with objects and physical environments and create smarter systems that are far more responsive to user demands. Walls that absorb radiation or block digital eavesdropping, and wireless, long-distance charging of devices are among the many possibilities. The book aspires to provide the foundational knowledge for creating an Internet of Materials, enabling

smart environments at any scale – from indoor wireless communications to medical imaging equipment. Although the set of disciplines involved covers a considerable span, we hope that the material will benefit experts and students alike.

Firewalls Don't Stop Dragons Syngress

“As an author, editor, and publisher, I never paid much attention to the competition—except in a few cases. This is one of those cases. The UNIX System Administration Handbook is one of the few books we ever measured ourselves against.” —Tim O’Reilly, founder of O’Reilly Media “This edition is for those whose systems live in the cloud or in virtualized data centers; those whose administrative work largely takes the form of automation and configuration source code; those who collaborate closely with developers, network engineers, compliance officers, and all the other worker bees who inhabit the modern hive.” —Paul Vixie, Internet Hall of Fame-recognized innovator and founder of ISC and Farsight Security “This book is fun and functional as a desktop reference. If you use UNIX and Linux systems, you need this book in your short-reach library. It covers a bit of the systems’ history but doesn’t bloviate. It’s just straightforward information delivered in a colorful and memorable fashion.” —Jason A. Nunnelley UNIX® and Linux® System Administration Handbook, Fifth Edition, is today’s definitive guide to installing, configuring, and maintaining any UNIX or Linux system, including systems that supply core Internet and cloud infrastructure. Updated for new distributions and cloud environments, this comprehensive guide covers best practices for every facet of system administration, including storage management, network design and administration, security, web hosting, automation, configuration management, performance analysis, virtualization, DNS, security, and the management of IT service organizations. The authors—world-class, hands-on technologists—offer indispensable new coverage of cloud platforms, the DevOps philosophy, continuous deployment, containerization, monitoring, and many other essential topics. Whatever your role in running systems and networks built on UNIX or Linux, this conversational, well-written guide will improve your efficiency and help solve your knottiest problems.

Maximum PC Springer

This book presents the proceedings of the Computing Conference 2019, providing a comprehensive collection of chapters focusing on core areas of computing and their real-world applications. Computing is an extremely broad discipline, encompassing a range of specialized fields, each focusing on particular areas of technology and types of application, and the conference offered pioneering researchers, scientists, industrial engineers, and students

from around the globe a platform to share new ideas and development experiences. Providing state-of-the-art intelligent methods and techniques for solving real-world problems, the book inspires further research and technological advances in this important area.

Linux Essentials O'Reilly Media

Provides a solid foundation for those considering a career in IT—covers the objectives of the new Linux Essentials Exam 010-160 v1.6 Linux is a secure, reliable, open source alternative to costly operating systems such as Microsoft Windows. As large organizations worldwide continue to add Linux servers, the need for IT professionals skilled in Linux continues to grow. The LPI Linux Essentials Study Guide is a valuable resource for anyone preparing to take the new Linux Essentials Exam—the entry-level certification from The Linux Professional Institute (LPI) which validates knowledge of Linux concepts and applications. Written by recognized experts on Linux and open source technologies, this accessible, user-friendly guide covers desktop skills, the command line, directories and files, networks, scripting, security, users and permissions, and much more. Clear, concise chapters provide numerous hands-on tutorials, real-world examples, color illustrations, and practical end-of-chapter exercises and review questions. An ideal introduction for those new to Linux or considering a career in IT, this guide helps readers: Learn the operation and components of Linux desktops and servers Understand open source software, licensing, and applications Configure networks, security, cloud services, storage, and devices Create users and groups and set permissions and ownership Use the command line and build automation scripts LPI Linux Essentials Study Guide: Exam 010 v1.6 is perfect for anyone beginning a career in IT, newcomers to Linux, students in computer courses, and system administrators working with other operating systems wanting to learn more about Linux and other open source solutions.

The Internet of Materials John Wiley & Sons

The first edition of a conference is a significant organizational and scientific gamble. In some cases, these challenges are rewarded by results well above the initial expectations. AFRICOMM 2009, the First International ICST Conference on e-Infrastructure and e-Services for Developing Countries, was clearly one of such cases. The conference aimed at bringing together

international researchers, public officers, policy makers and practitioners in ICT to discuss issues and trends, recent research, innovation advances, and on-the-field experiences related to e-Government, e-Governance, e-Infrastructure, and e-Business, with a focus on developing countries. It is in fact widely accepted that ICT Infrastructure and (e-*)services are key drivers for development, well-being, and improved quality of life. This was also highlighted by Kofi Annan, former UN General Secretary, in 2002: “While ICT cannot address all of [Africa's] problems, they can do much to place Africa on a firmer industrial footing. . . and strengthen the continent's human resources, with training that leads to sustainable livelihoods. ” AFRICOMM 2009 was organized in three tracks: two of them organized as Research Tracks, on Information and Communication Infrastructures and on e-Services for Developing Countries, and one Policy and Governance Track. Contributions to the first two tracks were selected by peer-review, while the policies session involved key stakeholders in the areas of ICT, development, and policy making who submitted position papers. Participation and selection of papers for the tracks was quite good.

Node.js for Embedded Systems No Starch Press

You've experienced the shiny, point-and-click surface of your Linux computer—now dive below and explore its depths with the power of the command line. The Linux Command Line takes you from your very first terminal keystrokes to writing full programs in Bash, the most popular Linux shell. Along the way you'll learn the timeless skills handed down by generations of gray-bearded, mouse-shunning gurus: file navigation, environment configuration, command chaining, pattern matching with regular expressions, and more. In addition to that practical knowledge, author William Shotts reveals the philosophy behind these tools and the rich heritage that your desktop Linux machine has inherited from Unix supercomputers of yore. As you make your way through the book's short, easily-digestible chapters, you'll learn how to: * Create and delete files, directories, and symlinks * Administer your system, including networking, package installation, and process management * Use standard input and output, redirection, and pipelines * Edit files with Vi, the world's most popular text editor * Write shell scripts to automate common or boring tasks * Slice and dice text files with cut, paste, grep, patch, and sed Once you overcome your initial "shell shock," you'll find that the command line is

a natural and expressive way to communicate with your computer. Just don't be surprised if your mouse starts to gather dust. A featured resource in the Linux Foundation's "Evolution of a SysAdmin"

Mastering OpenVPN Packt Publishing Ltd

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.

Machine Learning with TensorFlow Lite on Arduino and Ultra-Low-Power Microcontrollers Packt Publishing Ltd

Rely on this practical, end-to-end guide on cyber safety and online security written expressly for a non-technical audience. You will have just what you need to protect yourself—step by step, without judgment, and with as little jargon as possible. Just how secure is your computer right now? You probably don't really know. Computers and the Internet have revolutionized the modern world, but if you're like most people, you have no clue how these things work and don't know the real threats. Protecting your computer is like defending a medieval castle. While moats, walls, drawbridges, and castle guards can be effective, you'd go broke trying to build something dragon-proof. This book is not about protecting yourself from a targeted attack by the NSA; it's about armoring yourself against common hackers and mass surveillance. There are dozens of no-brainer things

we all should be doing to protect our computers and safeguard our data—just like wearing a seat belt, installing smoke alarms, and putting on sunscreen. Author Carey Parker has structured this book to give you maximum benefit with minimum effort. If you just want to know what to do, every chapter has a complete checklist with step-by-step instructions and pictures. The book contains more than 150 tips to make you and your family safer. It includes: Added steps for Windows 10 (Spring 2018) and Mac OS X High Sierra Expanded coverage on mobile device safety Expanded coverage on safety for kids online More than 150 tips with complete step-by-step instructions and pictures What You'll Learn Solve your password problems once and for all Browse the web safely and with confidence Block online tracking and dangerous ads Choose the right antivirus software for you Send files and messages securely Set up secure home networking Conduct secure shopping and banking online Lock down social media accounts Create automated backups of all your devices Manage your home computers Use your smartphone and tablet safely Safeguard your kids online And more! Who This Book Is For Those who use computers and mobile devices, but don't really know (or frankly care) how they work. This book is for people who just want to know what they need to do to protect themselves—step by step, without judgment, and with as little jargon as possible.

Expanding Your Raspberry Pi Createspace Independent Publishing Platform

A source of cross-compiler inspiration. There has never been a cross-compiler Guide like this. It contains 28 answers, much more than you can imagine; comprehensive answers and extensive details and references, with insights that have never before been offered in print. Get the information you need--fast! This all-embracing guide offers a thorough view of key knowledge and detailed insight. This Guide introduces what you want to know about cross-compiler. A quick look inside of some of the subjects covered: ARMv8 - Floating-point (VFP), Saxon XSLT - Versions, ETRAX CRIS - Software, SheevaPlug - Variants and modifications, OpenWrt - Development, Compilers, ARMv7 - Floating-point (VFP), List of BASIC dialects - D, Object Pascal - Legacy products, ARMhf - Floating-point (VFP), Aztec C - Current status, Target language (computing), Compiled, Google Web Toolkit - Development with GWT, Forth

(programming language) - Structure of the language, Script (computer programming) - Glue languages, Compiling, Visi On - Creation, Glue language - Glue languages, Scripting programming language - Glue languages, TI-BASIC, BCPL Uses and Implementations, Cygwin - Description, Cygwin - History, Pocket computer, Tiny C Compiler - Current status, GP2X - Open source development, Cross compiler - Canadian Cross, Macintosh Programmer's Workshop - Writing MPW tools, and much more...

Cross-Compiler 28 Success Secrets - 28 Most Asked Questions on Cross-Compiler - What You Need to Know John Wiley & Sons

Software Defined Networks: A Comprehensive Approach, Second Edition provides in-depth coverage of the technologies collectively known as Software Defined Networking (SDN). The book shows how to explain to business decision-makers the benefits and risks in shifting parts of a network to the SDN model, when to integrate SDN technologies in a network, and how to develop or acquire SDN applications. In addition, the book emphasizes the parts of the technology that encourage opening up the network, providing treatment for alternative approaches to SDN that expand the definition of SDN as networking vendors adopt traits of SDN to their existing solutions. Since the first edition was published, the SDN market has matured, and is being gradually integrated and morphed into something more compatible with mainstream networking vendors. This book reflects these changes, with coverage of the OpenDaylight controller and its support for multiple southbound protocols, the Inclusion of NETCONF in discussions on controllers and devices, expanded coverage of NFV, and updated coverage of the latest approved version (1.5.1) of the OpenFlow specification. Contains expanded coverage of controllers Includes a new chapter on NETCONF and SDN Presents expanded coverage of SDN in optical networks Provides support materials for use in computer networking courses

A Complete Guide to Wireless Configuration Addison-Wesley Professional

A Linux smart home is about controlling and monitoring devices and information around your home using a standard personal computer, Linux, and its vast array of open source tools. You don't have to be a master programmer to create one. If you like to tinker with Linux, Linux Smart Homes For Dummies will guide you through cool home automation projects that are as much fun to work on as they are to use. Home automation used to be limited to turning on lights and appliances, and maybe controlling your thermostat and lawn sprinkler, from your computer. While you still might not be able to create all the Jetsons' toys, today you can also Build a wireless network Create and set up a weather station Automate your TV and sound system Spy on your pets when you're not home Set up an answering system that knows what to do with calls Increase your home's security If you know how to use Linux and a few basic development tools — Perl, the BASH shell, development libraries, and the GNU C compiler—Linux Smart Homes For Dummies will help you do all these tricks and more. For example, you can Discover the best sources for Linux-based home automation devices Set up a wireless network, create a wireless access point, build a bridge between wired and wireless networks, and route your own network traffic Build a personal video recorder with MythTV that will record to DVD, or set up a wireless streaming music system Create a smart phone system that takes messages and forwards them to your fax, modem, or answering machine Build a weather station that notifies you of severe weather alerts Control and secure your home automation network, and even check on your house when you're away The bonus CD-ROM includes all kinds of cool open source software for your home automation projects. Linux Smart Homes For Dummies even includes lists of cool gadgets to check out and great ways to automate those boring household chores. A smart

home's a happy home!

From Asterisk to Zebra with Easy-to-Use Recipes "O'Reilly Media, Inc."

In Linux Unwired, you'll learn the basics of wireless computing, from the reasons why you'd want to go wireless in the first place, to setting up your wireless network or accessing wireless data services on the road. The book provides a complete introduction to all the wireless technologies supported by Linux. You'll learn how to install and configure a variety of wireless technologies to fit different scenarios, including an office or home network and for use on the road. You'll also learn how to get Wi-Fi running on a laptop, how to use Linux to create your own access point, and how to deal with cellular networks, Bluetooth, and Infrared. Other topics covered in the book include: Connecting to wireless hotspots Cellular data plans you can use with Linux Wireless security, including WPA and 802.1x Finding and mapping Wi-Fi networks with kismet and gpsd Connecting Linux to your Palm or Pocket PC Sending text messages and faxes from Linux through your cellular phone Linux Unwired is a one-stop wireless information source for on-the-go Linux users. Whether you're considering Wi-Fi as a supplement or alternative to cable and DSL, using Bluetooth to network devices in your home or office, or want to use cellular data plans for access to data nearly everywhere, this book will show you the full-spectrum view of wireless capabilities of Linux, and how to take advantage of them.

A Practical Real-World Approach Addison-Wesley Professional

Linux Kernel Networking takes you on a guided in-depth tour of the current Linux networking implementation and the theory behind it. Linux kernel networking is a complex topic, so the book won't burden you with topics not directly related to networking. This book will also not overload you with cumbersome line-by-line code walkthroughs not directly related to what you're searching for; you'll find just what you need, with in-depth explanations in each chapter and a quick reference at the end of each chapter. Linux Kernel Networking is the only up-to-date reference guide to understanding how networking is implemented, and it will be indispensable in years to come since so many devices now use Linux or operating systems based on Linux, like Android, and since Linux is so prevalent in the data center arena, including Linux-based virtualization technologies like Xen and KVM.

Linksys WRT54G Ultimate Hacking No Starch Press

Deep learning networks are getting smaller. Much smaller. The Google Assistant team can detect words with a model just 14 kilobytes in size—small enough to run on a microcontroller. With this practical book you'll enter the field of TinyML, where deep learning and embedded systems combine to make astounding things possible with tiny devices. Pete Warden and Daniel Situnayake explain how you can train models small enough to fit into any environment. Ideal for software and hardware developers who want to build embedded systems using machine learning, this guide walks you through creating a series of TinyML projects, step-by-step. No machine learning or microcontroller experience is necessary. Build a speech recognizer, a camera that detects people, and a magic wand that responds to gestures Work with Arduino and ultra-low-power microcontrollers Learn the essentials of ML and how to train your own models Train models to understand audio, image, and accelerometer data Explore TensorFlow Lite for Microcontrollers, Google's toolkit for TinyML Debug applications and provide safeguards for privacy and security Optimize latency, energy usage, and model and binary size Kismet Hacking No Starch Press

This soup-to-nuts collection of recipes covers everything you need to know to perform your job as a Linux network administrator, whether you're new to the job or have years of experience. With Linux Networking Cookbook, you'll dive straight into the gnarly hands-on work of building and maintaining a computer network. Running a network doesn't mean you have all the answers. Networking is a complex subject with reams of reference material that's difficult to keep straight, much less remember. If you want a book that lays out the steps for specific tasks, that clearly explains the commands and configurations, and does not tax your patience with endless ramblings and meanderings into theory and obscure RFCs, this is the book for you. You will find

recipes for: Building a gateway, firewall, and wireless access point on a Linux network Building a VoIP server with Asterisk Secure remote administration with SSH Building secure VPNs with OpenVPN, and a Linux PPTP VPN server Single sign-on with Samba for mixed Linux/Windows LANs Centralized network directory with OpenLDAP Network monitoring with Nagios or MRTG Getting acquainted with IPv6 Setting up hands-free networks installations of new systems Linux system administration via serial console And a lot more. Each recipe includes a clear, hands-on solution with tested code, plus a discussion on why it works. When you need to solve a network problem without delay, and don't have the time or patience to comb through reference books or the Web for answers, Linux Networking Cookbook gives you exactly what you need.

Mastering Embedded Linux Programming Full Circle Magazine

Maximum PC is the magazine that every computer fanatic, PC gamer or content creator must read. Each and every issue is packed with punishing product reviews, insightful and innovative how-to stories and the illuminating technical articles that enthusiasts crave.

Embedded Linux Primer Apress

Build the next generation of connected projects. The Yún is one of the most powerful and flexible hardware development boards in the Arduino range. It combines the ease-of-use of the Arduino platform, with the power of a 400 MHz Atheros AR9331 Wi-Fi system-on-chip (WiSOC) that runs Linux. But if you are not experienced and confident in working with Linux-based operating systems, it may be difficult for you to use the Yún to its full potential. Bob Hammell is the author of popular Arduino learning resources, such as Connecting Arduino: Programming and Networking with the Ethernet Shield. In this book, he guides you through all of the Arduino Yún's features and explains how to make use of this unique board. Using interesting and fun examples, in Arduino Meets Linux: The User's Guide to Arduino Yún Development you can learn

how to: Connect your Arduino Yún to your network, using built-in support for Wi-Fi and Ethernet; Work with OpenWrt-Yun Linux through the command line; Use the Bridge Library to communicate and share data between both of the Yún's chips; Write Python and shell scripts to automate tasks and use the power of the AR9331 in your Arduino projects; Work with Temboo and third-party APIs to access popular web services; Host your own websites and application programming interfaces (APIs) on the Yún; Use USB devices, such as audio interfaces and gamepads from Microsoft Xbox 360(R) and Sony PlayStation(R) games consoles; Build Arduino projects that act as a keyboard or mouse when you plug your Yún into a PC or Mac; Add voice recognition and speech to your Arduino projects; Download source code, view demo videos, and access extra projects from the book's companion website, ArduinoMeetsLinux.com; And much, much more. Whether you are an experienced Linux developer looking for specific details on using the Arduino Yún or a beginner who has never used Linux before, you can find all of the key information that you need in this book. With the Arduino Yún, you can take your Arduino projects to the next level. This book shows you how.

The IoT Hacker's Handbook "O'Reilly Media, Inc." The following list describes what you can get from this book: Information that lets you get set up to develop using the Yocto Project. Information to help developers who are new to the open source environment and to the distributed revision control system Git, which the Yocto Project uses. An understanding of common end-to-end development models and tasks. Information about common development tasks generally used during image development for embedded devices. Information on using the Yocto Project integration of the QuickEMULATOR (QEMU), which lets you simulate running on hardware an image you have built using the OpenEmbedded build system. Many references to other sources of related information.

Linux Unwired John Wiley & Sons

In Linux Unwired, you'll learn the basics of wireless computing, from the reasons why you'd want to go wireless in the first place, to setting up your wireless network or accessing wireless data services on the road. The book provides a complete introduction to all the wireless technologies supported by Linux. You'll learn how to install and configure a variety of wireless technologies to fit different scenarios, including an office or home network and for use on the road. You'll also learn how to get Wi-Fi running on a laptop, how to use Linux to create your own access point, and how to deal with cellular networks, Bluetooth, and Infrared. Other topics covered in the book include: Connecting to wireless hotspots Cellular data plans you can use with Linux Wireless security, including WPA and 802.1x Finding and mapping Wi-Fi networks with kismet and gpsd Connecting Linux to your Palm or Pocket PC Sending text messages and faxes from Linux through your cellular phone Linux Unwired is a one-stop wireless information source for on-the-go Linux users. Whether you're considering Wi-Fi as a supplement or alternative to cable and DSL, using Bluetooth to network devices in your home or office, or want to use cellular data plans for access to data nearly everywhere, this book will show you the full-spectrum view of wireless capabilities of Linux, and how to take advantage of them.