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Linux Device Drivers Linux Device Drivers Development Linux Kernel Programming Part 2 - Char Device Drivers and Kernel Synchronization Linux Device Drivers The Linux Kernel Module Programming Guide Linux Device Drivers Exploring BeagleBone Linux Device Driver Development Cookbook Linux Kernel Programming Essential Linux Device Drivers FreeBSD Device Drivers Mastering Linux Device Driver Development Linux Device Driver Development Easy Linux Device Driver, Second Edition Writing DOS Device Drivers in C Embedded Linux Primer Linux Device Drivers Development Professional Linux Kernel Architecture Understanding Linux Network Internals Advanced Linux Programming Mastering Embedded Linux Programming Raspberry Pi IoT In C Using Linux Drivers Mastering Embedded Linux Programming Understanding the Linux Kernel Linux in a Nutshell Exploring Raspberry Pi Linux System Programming Dadgum That's Good FreeBSD Device Drivers Writing a UNIX? Device Driver Linux Driver Development for Embedded Processors - Second Edition Linux Device Drivers Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow GNU/Linux Rapid Embedded Programming Linux Device Drivers, 3E Linux

Kernel Development Linux Kernel and Driver Development - Practical Labs Climate Change The Linux Networking Architecture Linux System Programming Techniques

Understanding Linux Network Internals Feb 11 2022 Benvenuti describes the relationship between the Internet's TCP/IP implementation and the Linux Kernel so that programmers and advanced administrators can modify and fine-tune their network environment.

Mastering Embedded Linux Programming Dec 12 2021 Harness the power of Linux to create versatile and robust embedded solutions Key Features Learn how to develop and configure robust embedded Linux devices Explore the new features of Linux 5.4 and the Yocto Project 3.1 (Dunfell) Discover different ways to debug and profile your code in both user space and the Linux kernel Book Description If you're looking for a book that will demystify embedded Linux, then you've come to the right place. *Mastering Embedded Linux Programming* is a fully comprehensive guide that can serve both as means to learn new things or as a handy reference. The first few chapters of this book will break down the fundamental elements that underpin all embedded Linux projects: the toolchain, the bootloader, the kernel, and the root filesystem. After that, you will learn how to create each of these elements from scratch and automate the process using Buildroot and the Yocto Project. As you progress, the book will show you how to implement an effective storage strategy for flash memory chips and install updates to a device remotely once it's deployed. You'll also learn about the key aspects of writing code for embedded Linux, such as how to access hardware from apps, the implications of writing multi-threaded code, and techniques to manage memory in an efficient way. The final chapters demonstrate how to debug your code, whether it resides in apps or in the Linux kernel itself. You'll also cover the different tracers and profilers that are available for

Linux so that you can quickly pinpoint any performance bottlenecks in your system. By the end of this Linux book, you'll be able to create efficient and secure embedded devices using Linux. What you will learn

- Use Buildroot and the Yocto Project to create embedded Linux systems
- Troubleshoot BitBake build failures and streamline your Yocto development workflow
- Update IoT devices securely in the field using Mender or balena
- Prototype peripheral additions by reading schematics, modifying device trees, soldering breakout boards, and probing pins with a logic analyzer
- Interact with hardware without having to write kernel device drivers
- Divide your system up into services supervised by BusyBox
- runit
- Debug devices remotely using GDB and measure the performance of systems using tools such as perf, ftrace, eBPF, and Callgrind

Who this book is for If you're a systems software engineer or system administrator who wants to learn how to implement Linux on embedded devices, then this book is for you. It's also aimed at embedded systems engineers accustomed to programming for low-power microcontrollers, who can use this book to help make the leap to high-speed systems on chips that can run Linux. Anyone who develops hardware that needs to run Linux will find something useful in this book - but before you get started, you'll need a solid grasp on POSIX standard, C programming, and shell scripting.

Linux System Programming Techniques Apr 23 2020 Find solutions to all your problems related to Linux system programming using practical recipes for developing your own system programs

Key Features

- Develop a deeper understanding of how Linux system programming works
- Gain hands-on experience of working with different Linux projects with the help of practical examples
- Learn how to develop your own programs for Linux

Book Description Linux is the world's most popular open source operating system (OS). *Linux System Programming Techniques* will enable you to extend the Linux OS with your own system programs and communicate with other programs on the system. The

book begins by exploring the Linux filesystem, its basic commands, built-in manual pages, the GNU compiler collection (GCC), and Linux system calls. You'll then discover how to handle errors in your programs and will learn to catch errors and print relevant information about them. The book takes you through multiple recipes on how to read and write files on the system, using both streams and file descriptors. As you advance, you'll delve into forking, creating zombie processes, and daemons, along with recipes on how to handle daemons using systemd. After this, you'll find out how to create shared libraries and start exploring different types of interprocess communication (IPC). In the later chapters, recipes on how to write programs using POSIX threads and how to debug your programs using the GNU debugger (GDB) and Valgrind will also be covered. By the end of this Linux book, you will be able to develop your own system programs for Linux, including daemons, tools, clients, and filters. What you will learn

Discover how to write programs for the Linux system using a wide variety of system calls
Delve into the working of POSIX functions
Understand and use key concepts such as signals, pipes, IPC, and process management
Find out how to integrate programs with a Linux system
Explore advanced topics such as filesystem operations, creating shared libraries, and debugging your programs
Gain an overall understanding of how to debug your programs using Valgrind

Who this book is for
This book is for anyone who wants to develop system programs for Linux and gain a deeper understanding of the Linux system. The book is beneficial for anyone who is facing issues related to a particular part of Linux system programming and is looking for specific recipes or solutions.

FreeBSD Device Drivers Apr 03 2021 Device drivers make it possible for your software to communicate with your hardware, and because every operating system has specific requirements, driver writing is nontrivial. When developing for FreeBSD, you've probably had to scour the Internet

and dig through the kernel sources to figure out how to write the drivers you need. Thankfully, that stops now. In *FreeBSD Device Drivers*, Joseph Kong will teach you how to master everything from the basics of building and running loadable kernel modules to more complicated topics like thread synchronization. After a crash course in the different FreeBSD driver frameworks, extensive tutorial sections dissect real-world drivers like the parallel port printer driver. You'll learn: -All about Newbus, the infrastructure used by FreeBSD to manage the hardware devices on your system -How to work with ISA, PCI, USB, and other buses -The best ways to control and communicate with the hardware devices from user space -How to use Direct Memory Access (DMA) for maximum system performance -The inner workings of the virtual null modem terminal driver, the USB printer driver, the Intel PCI Gigabit Ethernet adapter driver, and other important drivers -How to use Common Access Method (CAM) to manage host bus adapters (HBAs) Concise descriptions and extensive annotations walk you through the many code examples. Don't waste time searching man pages or digging through the kernel sources to figure out how to make that arcane bit of hardware work with your system. *FreeBSD Device Drivers* gives you the framework that you need to write any driver you want, now.

Linux Device Drivers Development Jul 31 2023 Learn to develop customized device drivers for your embedded Linux system About This Book Learn to develop customized Linux device drivers Learn the core concepts of device drivers such as memory management, kernel caching, advanced IRQ management, and so on. Practical experience on the embedded side of Linux Who This Book Is For This book will help anyone who wants to get started with developing their own Linux device drivers for embedded systems. Embedded Linux users will benefit highly from this book. This book covers all about device driver development, from char drivers to network device drivers to memory

management. What You Will Learn Use kernel facilities to develop powerful drivers Develop drivers for widely used I2C and SPI devices and use the regmap API Write and support devicetree from within your drivers Program advanced drivers for network and frame buffer devices Delve into the Linux irqdomain API and write interrupt controller drivers Enhance your skills with regulator and PWM frameworks Develop measurement system drivers with IIO framework Get the best from memory management and the DMA subsystem Access and manage GPIO subsystems and develop GPIO controller drivers In Detail Linux kernel is a complex, portable, modular and widely used piece of software, running on around 80% of servers and embedded systems in more than half of devices throughout the World. Device drivers play a critical role in how well a Linux system performs. As Linux has turned out to be one of the most popular operating systems used, the interest in developing proprietary device drivers is also increasing steadily. This book will initially help you understand the basics of drivers as well as prepare for the long journey through the Linux Kernel. This book then covers drivers development based on various Linux subsystems such as memory management, PWM, RTC, IIO, IRQ management, and so on. The book also offers a practical approach on direct memory access and network device drivers. By the end of this book, you will be comfortable with the concept of device driver development and will be in a position to write any device driver from scratch using the latest kernel version (v4.13 at the time of writing this book). Style and approach A set of engaging examples to develop Linux device drivers

Linux Driver Development for Embedded Processors - Second Edition Jan 30 2021 LINUX DRIVER DEVELOPMENT FOR EMBEDDED PROCESSORS - SECOND EDITION - The flexibility of Linux embedded, the availability of powerful, energy efficient processors designed for embedded computing and the low cost of new processors are encouraging many industrial companies to come

up with new developments based on embedded processors. Current engineers have in their hands powerful tools for developing applications previously unimagined, but they need to understand the countless features that Linux offers today. This book will teach you how to develop device drivers for Device Tree Linux embedded systems. You will learn how to write different types of Linux drivers, as well as the appropriate APIs (Application Program Interfaces) and methods to interface with kernel and user spaces. This is a book is meant to be practical, but also provides an important theoretical base. More than twenty drivers are written and ported to three different processors. You can choose between NXP i.MX7D, Microchip SAMA5D2 and Broadcom BCM2837 processors to develop and test the drivers, whose implementation is described in detail in the practical lab sections of the book. Before you start reading, I encourage you to acquire any of these processor boards whenever you have access to some GPIOs, and at least one SPI and I2C controllers. The hardware configurations of the different evaluation boards used to develop the drivers are explained in detail throughout this book; one of the boards used to implement the drivers is the famous Raspberry PI 3 Model B board. You will learn how to develop drivers, from the simplest ones that do not interact with any external hardware, to drivers that manage different kind of devices: accelerometers, DACs, ADCs, RGB LEDs, Multi-Display LED controllers, I/O expanders, and Buttons. You will also develop DMA drivers, drivers that manage interrupts, and drivers that write/read on the internal registers of the processor to control external devices. To easy the development of some of these drivers, you will use different types of Frameworks: Miscellaneous framework, LED framework, UIO framework, Input framework and the IIO industrial one. This second edition has been updated to the v4.9 LTS kernel. Recently, all the drivers have been ported to the new Microchip SAMA5D27-SOM1 (SAMA5D27 System On Module) using kernel 4.14 LTS and included in the GitHub repository of this book; these drivers

have been tested in the ATSAM5D27-SOM1-EK1 evaluation platform; the ATSAM5D27-SOM1-EK1 practice lab settings are not described throughout the text of this book, but in a practice labs user guide that can be downloaded from the book's GitHub.

Linux Device Drivers Mar 27 2023 This practical guide is for anyone who wants to support computer peripherals under the Linux operating system or who wants to develop new hardware and run it under Linux. It shows step-by-step how to write a driver for character devices, m block devices, and network interfaces, illustrated with examples you can compile and run.

The Linux Kernel Module Programming Guide Apr 27 2023 Linux Kernel Module Programming Guide is for people who want to write kernel modules. It takes a hands-on approach starting with writing a small "hello, world" program, and quickly moves from there. Far from a boring text on programming, Linux Kernel Module Programming Guide has a lively style that entertains while it educates. An excellent guide for anyone wishing to get started on kernel module programming. *** Money raised from the sale of this book supports the development of free software and documentation.

Linux Device Driver Development Aug 20 2022 Get up to speed with the most important concepts in driver development and focus on common embedded system requirements such as memory management, interrupt management, and locking mechanisms Key FeaturesWrite feature-rich and customized Linux device drivers for any character, SPI, and I2C deviceDevelop a deep understanding of locking primitives, IRQ management, memory management, DMA, and so onGain practical experience in the embedded side of Linux using GPIO, IIO, and input subsystemsBook Description Linux is by far the most-used kernel on embedded systems. Thanks to its subsystems, the Linux kernel supports almost all of the application fields in the industrial world. This updated

second edition of Linux Device Driver Development is a comprehensive introduction to the Linux kernel world and the different subsystems that it is made of, and will be useful for embedded developers from any discipline. You'll learn how to configure, tailor, and build the Linux kernel. Filled with real-world examples, the book covers each of the most-used subsystems in the embedded domains such as GPIO, direct memory access, interrupt management, and I2C/SPI device drivers. This book will show you how Linux abstracts each device from a hardware point of view and how a device is bound to its driver(s). You'll also see how interrupts are propagated in the system as the book covers the interrupt processing mechanisms in-depth and describes every kernel structure and API involved. This new edition also addresses how not to write device drivers using user space libraries for GPIO clients, I2C, and SPI drivers. By the end of this Linux book, you'll be able to write device drivers for most of the embedded devices out there. What you will learn

- Download, configure, build, and tailor the Linux kernel
- Describe the hardware using a device tree
- Write feature-rich platform drivers and leverage I2C and SPI buses
- Get the most out of the new concurrency managed workqueue infrastructure
- Understand the Linux kernel timekeeping mechanism and use time-related APIs
- Use the regmap framework to factor the code and make it generic
- Offload CPU for memory copies using DMA
- Interact with the real world using GPIO, IIO, and input subsystems

Who this book is for This Linux OS book is for embedded system and embedded Linux enthusiasts/developers who want to get started with Linux kernel development and leverage its subsystems. Electronic hackers and hobbyists interested in Linux kernel development as well as anyone looking to interact with the platform using GPIO, IIO, and input subsystems will also find this book useful.

Linux Device Driver Development Cookbook Jan 25 2023 Over 30 recipes to develop custom drivers for your embedded Linux applications. Key Features

- Use Kernel facilities to develop powerful

drivers

Via a practical approach, learn core concepts of developing device drivers

Program a custom character device to get access to kernel internals

Book Description Linux is a unified kernel that is widely used to develop embedded systems. As Linux has turned out to be one of the most popular operating systems used, the interest in developing proprietary device drivers has also increased. Device drivers play a critical role in how the system performs and ensures that the device works in the manner intended. By offering several examples on the development of character devices and how to use other kernel internals, such as interrupts, kernel timers, and wait queue, as well as how to manage a device tree, you will be able to add proper management for custom peripherals to your embedded system. You will begin by installing the Linux kernel and then configuring it. Once you have installed the system, you will learn to use the different kernel features and the character drivers. You will also cover interrupts in-depth and how you can manage them. Later, you will get into the kernel internals required for developing applications. Next, you will implement advanced character drivers and also become an expert in writing important Linux device drivers. By the end of the book, you will be able to easily write a custom character driver and kernel code as per your requirements. What you will learn

Become familiar with the latest kernel releases (4.19+/5.x)

running on the ESPRESSObin devkit, an ARM 64-bit machine

Download, configure, modify, and build kernel sources

Add and remove a device driver or a module from the kernel

Master kernel programming

Understand how to implement character drivers to manage different kinds of computer peripherals

Become well versed with kernel helper functions and objects that can be used to build kernel applications

Acquire a knowledge of in-depth concepts to manage custom hardware with Linux from both the kernel and user space

Who this book is for This book will help anyone who wants to develop their own Linux device drivers for embedded systems. Having basic hand-on with Linux

operating system and embedded concepts is necessary.

Linux System Programming Jun 05 2021 UNIX, UNIX LINUX & UNIX TCL/TK. Write software that makes the most effective use of the Linux system, including the kernel and core system libraries. The majority of both Unix and Linux code is still written at the system level, and this book helps you focus on everything above the kernel, where applications such as Apache, bash, cp, vim, Emacs, gcc, gdb, glibc, ls, mv, and X exist. Written primarily for engineers looking to program at the low level, this updated edition of Linux System Programming gives you an understanding of core internals that makes for better code, no matter where it appears in the stack. -- Provided by publisher.

Linux Kernel Development Aug 27 2020 An authoritative, practical guide that helps programmers better understand the Linux kernel and to write and develop kernel code.

Easy Linux Device Driver, Second Edition Jul 19 2022 Easy Linux Device Driver : First Step Towards Device Driver Programming Easy Linux Device Driver book is an easy and friendly way of learning device driver programming . Book contains all latest programs along with output screen screenshots. Highlighting important sections and stepwise approach helps for quick understanding of programming . Book contains Linux installation ,Hello world program up to USB 3.0 ,Display Driver ,PCI device driver programming concepts in stepwise approach. Program gives best understanding of theoretical and practical fundamentals of Linux device driver. Beginners should start learning Linux device driver from this book to become device driver expertise. Topics covered: Introduction of Linux Advantages of Linux History of Linux Architecture of Linux Definations Ubuntu installation Ubuntu Installation Steps User Interface Difference About KNOPPIX Important links Terminal: Soul of Linux Creating Root account Terminal Commands Virtual Editor Commands Linux Kernel Linux Kernel Internals Kernel Space and User space Device Driver Place of Driver in System

Device Driver working Characteristics of Device Driver Module Commands Hello World Program pre-settings Write Program Printk function Makefile Run program Parameter passing Parameter passing program Parameter Array Process related program Process related program Character Device Driver Major and Minor number API to registers a device Program to show device number Character Driver File Operations File operation program. Include .h header Functions in module.h file Important code snippets Summary of file operations PCI Device Driver Direct Memory Access Module Device Table Code for Basic Device Driver Important code snippets USB Device Driver Fundamentals Architecture of USB device driver USB Device Driver program Structure of USB Device Driver Parts of USB end points Important features USB information Driver USB device Driver File Operations Using URB Simple data transfer Program to read and write Important code snippets Gadget Driver Complete USB Device Driver Program Skeleton Driver Program Special USB 3.0 USB 3.0 Port connection Bulk endpoint streaming Stream ID Device Driver Lock Mutual Exclusion Semaphore Spin Lock Display Device Driver Frame buffer concept Framebuffer Data Structure Check and set Parameter Accelerated Method Display Driver summary Memory Allocation Kmalloc Vmalloc Ioremap Interrupt Handling interrupt registration Proc interface Path of interrupt Programming Tips Softirqs, Tasklets, Work Queues I/O Control Introducing ioctl Prototype Stepwise execution of ioctl Sample Device Driver Complete memory Driver Complete Parallel Port Driver Device Driver Debugging Data Display Debugger Graphical Display Debugger Kernel Graphical Debugger Appendix I Exported Symbols Kobjects, Ksets, and Subsystems DMA I/O

Linux Kernel Programming Dec 24 2022 Learn how to write high-quality kernel module code, solve common Linux kernel programming issues, and understand the fundamentals of Linux kernel internals Key FeaturesDiscover how to write kernel code using the Loadable Kernel Module

frameworkExplore industry-grade techniques to perform efficient memory allocation and data synchronization within the kernelUnderstand the essentials of key internals topics such as kernel architecture, memory management, CPU scheduling, and kernel synchronizationBook Description Linux Kernel Programming is a comprehensive introduction for those new to Linux kernel and module development. This easy-to-follow guide will have you up and running with writing kernel code in next-to-no time. This book uses the latest 5.4 Long-Term Support (LTS) Linux kernel, which will be maintained from November 2019 through to December 2025. By working with the 5.4 LTS kernel throughout the book, you can be confident that your knowledge will continue to be valid for years to come. You'll start the journey by learning how to build the kernel from the source. Next, you'll write your first kernel module using the powerful Loadable Kernel Module (LKM) framework. The following chapters will cover key kernel internals topics including Linux kernel architecture, memory management, and CPU scheduling. During the course of this book, you'll delve into the fairly complex topic of concurrency within the kernel, understand the issues it can cause, and learn how they can be addressed with various locking technologies (mutexes, spinlocks, atomic, and refcount operators). You'll also benefit from more advanced material on cache effects, a primer on lock-free techniques within the kernel, deadlock avoidance (with lockdep), and kernel lock debugging techniques. By the end of this kernel book, you'll have a detailed understanding of the fundamentals of writing Linux kernel module code for real-world projects and products. What you will learnWrite high-quality modular kernel code (LKM framework) for 5.x kernelsConfigure and build a kernel from sourceExplore the Linux kernel architectureGet to grips with key internals regarding memory management within the kernelUnderstand and work with various dynamic kernel memory alloc/dealloc APIsDiscover key internals aspects regarding CPU scheduling within the

kernelGain an understanding of kernel concurrency issuesFind out how to work with key kernel synchronization primitivesWho this book is for This book is for Linux programmers beginning to find their way with Linux kernel development. If you're a Linux kernel and driver developer looking to overcome frequent and common kernel development issues, or understand kernel intervals, you'll find plenty of useful information. You'll need a solid foundation of Linux CLI and C programming before you can jump in.

Linux in a Nutshell Aug 08 2021 Over the last few years, Linux has grown both as an operating system and a tool for personal and business use. Simultaneously becoming more user friendly and more powerful as a back-end system, Linux has achieved new plateaus: the newer filesystems have solidified, new commands and tools have appeared and become standard, and the desktop--including new desktop environments--have proved to be viable, stable, and readily accessible to even those who don't consider themselves computer gurus. Whether you're using Linux for personal software projects, for a small office or home office (often termed the SOHO environment), to provide services to a small group of colleagues, or to administer a site responsible for millions of email and web connections each day, you need quick access to information on a wide range of tools. This book covers all aspects of administering and making effective use of Linux systems. Among its topics are booting, package management, and revision control. But foremost in Linux in a Nutshell are the utilities and commands that make Linux one of the most powerful and flexible systems available. Now in its fifth edition, Linux in a Nutshell brings users up-to-date with the current state of Linux. Considered by many to be the most complete and authoritative command reference for Linux available, the book covers all substantial user, programming, administration, and networking commands for the most common Linux distributions. Comprehensive but concise, the fifth edition

has been updated to cover new features of major Linux distributions. Configuration information for the rapidly growing commercial network services and community update services is one of the subjects covered for the first time. But that's just the beginning. The book covers editors, shells, and LILO and GRUB boot options. There's also coverage of Apache, Samba, Postfix, sendmail, CVS, Subversion, Emacs, vi, sed, gawk, and much more. Everything that system administrators, developers, and power users need to know about Linux is referenced here, and they will turn to this book again and again.

[The Linux Networking Architecture](#) May 24 2020 This unique Linux networking tutorial reference provides students with a practical overview and understanding of the implementation of networking protocols in the Linux kernel. By gaining a familiarity with the Linux kernel architecture, students can modify and enhance the functionality of protocol instances. -- Provided by publisher.

[Exploring BeagleBone](#) Feb 23 2023 In-depth instruction and practical techniques for building with the BeagleBone embedded Linux platform Exploring BeagleBone is a hands-on guide to bringing gadgets, gizmos, and robots to life using the popular BeagleBone embedded Linux platform. Comprehensive content and deep detail provide more than just a BeagleBone instruction manual—you'll also learn the underlying engineering techniques that will allow you to create your own projects. The book begins with a foundational primer on essential skills, and then gradually moves into communication, control, and advanced applications using C/C++, allowing you to learn at your own pace. In addition, the book's companion website features instructional videos, source code, discussion forums, and more, to ensure that you have everything you need. The BeagleBone's small size, high performance, low cost, and extreme adaptability have made it a favorite development platform, and the Linux software base allows for complex yet flexible functionality. The

BeagleBone has applications in smart buildings, robot control, environmental sensing, to name a few; and, expansion boards and peripherals dramatically increase the possibilities. Exploring BeagleBone provides a reader-friendly guide to the device, including a crash course in computer engineering. While following step by step, you can: Get up to speed on embedded Linux, electronics, and programming Master interfacing electronic circuits, buses and modules, with practical examples Explore the Internet-connected BeagleBone and the BeagleBone with a display Apply the BeagleBone to sensing applications, including video and sound Explore the BeagleBone's Programmable Real-Time Controllers Hands-on learning helps ensure that your new skills stay with you, allowing you to design with electronics, modules, or peripherals even beyond the BeagleBone. Insightful guidance and online peer support help you transition from beginner to expert as you master the techniques presented in Exploring BeagleBone, the practical handbook for the popular computing platform.

Raspberry Pi IoT In C Using Linux Drivers Nov 10 2021 The Raspberry Pi makes an ideal match for the Internet of Things. To put it to good use in IoT you need two areas of expertise, electronics and programming and this presents a barrier to getting started. However, there is an overlooked route that can provide a shortcut. Pi OS, the Raspberry Pi's operating system is Linux based and Linux drivers are available for many off-the-shelf IoT devices. These provide a very easy-to-use, high-level way of working. The problem that this book solves is that there is very little documentation to help you get started. In it Harry Fairhead explains the principles so that you can tackle new devices and he also guides you through of using external hardware via standard Linux drivers. Throughout this book you will find a practical approach to understanding electronic circuits and datasheets and translating this to code, specifically using the C programming language. The main reason for

choosing C is speed, a crucial factor when you are writing programs to communicate with the outside world and if you are familiar with another programming language, C shouldn't be hard to pick up. After a quick tour of the Raspberry Pi ecosystem, Visual Studio Code (VS Code) and how it can be used to develop remotely, is introduced. The first IoT program anyone writes is "blinky" to flash an LED and this book is no exception, but it might not be quite what you expect. Instead of using a GPIO line it uses the Linux LED driver - no hardware and no fuss. The GPIO isn't left out, however, as the next three chapters focus on its use via the new GPIO character driver, which replaces the old and very common sysfs GPIO driver. This is the way to do modern GPIO. A key component in any look at Linux and its relationship to hardware is the relatively new Device Tree. While most accounts of this resource are aimed at device driver writers, this one is aimed at device driver users and to this end we look at the DHT22 temperature and humidity driver. After a brief detour into some basic electronics, we look at Pulse Width Modulation supported via a driver rather than needing to be implemented using the GPIO. From here we tackle the two standard buses, I2C and SPI, first going through the basics and then looking at the two attempts to impose a higher organization, the hardware monitoring system, Hwmon, and Industrial I/O, IIO. The third standard bus, although generally not supported in hardware is the 1-Wire bus. This is covered in detail and even includes an introduction to using Netlink, which uses the sockets API to send messages to and from the kernel to access the driver. The final chapter takes things to the next level and considers creating your own custom overlays by writing fragments to the device tree. Harry Fairhead has worked with microprocessors, and electronics in general, for many years and is an enthusiastic proponent of the IoT. He is the author of Raspberry Pi IoT in C, which has recently been republished in its second edition, updated for Raspberry Pi 4 and co-author of Raspberry Pi IoT in Python Using

GPIO Zero. His other recent books include *Micro: bit IoT in C*, *Fundamental C: Getting Closer To The Machine* and *Applying C For The IoT With Linux*.

GNU/Linux Rapid Embedded Programming Oct 29 2020 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.

Writing DOS Device Drivers in C Jun 17 2022 C has quickly become the most popular programming language. This timely handbook now supplies complete instructions for creating DOS device drivers in this versatile language, thus providing a simplified way to standardize the electrical and mechanical requirements of peripherals. Presents a logical, easy-to-implement, uniform approach for creating all device drivers and features numerous operational examples.

Linux Device Drivers, 3E Sep 28 2020 Device drivers literally drive everything you're interested in--disks, monitors, keyboards, modems--everything outside the computer chip and memory. And writing device drivers is one of the few areas of programming for the Linux operating system that calls for unique, Linux-specific knowledge. For years now, programmers have relied on the classic Linux Device Drivers from O'Reilly to master this critical subject. Now in its third edition, this bestselling guide provides all the information you'll need to write drivers for a wide range of devices. *Writing a UNIX? Device Driver* Mar 03 2021 Offers practical, hands-on guidance in developing your own device drives. Clearly demonstrates how to write device drivers for adding disk drives, printers, magnetic tapes and other peripherals to your Unix system. Presents procedures for developing and testing new device drivers including how to select a convenient working directory; use make-files; preserve and boot alternative kernel versions; debug driver code and much more. Packed with examples which illustrate each operation in practice.

Climate Change Jun 25 2020 Climate Change: Evidence and Causes is a jointly produced publication of The US National Academy of Sciences and The Royal Society. Written by a UK-US team of leading climate scientists and reviewed by climate scientists and others, the publication is intended as a brief, readable reference document for decision makers, policy makers, educators, and other individuals seeking authoritative information on the some of the questions that continue to be asked. Climate Change makes clear what is well-established and where understanding is still developing. It echoes and builds upon the long history of climate-related work from both national academies, as well as on the newest climate-change assessment from the United Nations' Intergovernmental Panel on Climate Change. It touches on current areas of active debate and ongoing research, such as the link between ocean heat content and the rate of warming.

Linux Device Drivers Development Apr 15 2022 Learn to develop customized device drivers for your embedded Linux system

About This Book* Learn to develop customized Linux device drivers* Learn the core concepts of device drivers such as memory management, kernel caching, advanced IRQ management, and so on.* Practical experience on the embedded side of Linux

Who This Book Is ForThis book will help anyone who wants to get started with developing their own Linux device drivers for embedded systems. Embedded Linux users will benefit highly from this book.

This book covers all about device driver development, from char drivers to network device drivers to memory management.

What You Will Learn* Use kernel facilities to develop powerful drivers* Develop drivers for widely used I2C and SPI devices and use the regmap API* Write and support devicetree from within your drivers* Program advanced drivers for network and frame buffer devices* Delve into the Linux irqdomain API and write interrupt controller drivers* Enhance your skills with regulator and PWM frameworks* Develop measurement system drivers with IIO framework* Get the best from memory management and the DMA subsystem* Access and manage GPIO subsystems and develop GPIO controller drivers

In DetailLinux kernel is a complex, portable, modular and widely used piece of software, running on around 80% of servers and embedded systems in more than half of devices throughout the World. Device drivers play a critical role in how well a Linux system performs. As Linux has turned out to be one of the most popular operating systems used, the interest in developing proprietary device drivers is also increasing steadily.

This book will initially help you understand the basics of drivers as well as prepare for the long journey through the Linux Kernel. This book then covers drivers development based on various Linux subsystems such as memory management, PWM, RTC, IIO, IRQ management, and so on. The book also offers a practical approach on direct memory access and network device drivers.

By the end of this book, you will be

comfortable with the concept of device driver development and will be in a position to write any device driver from scratch using the latest kernel version (v4.13 at the time of writing this book). Style and approach A set of engaging examples to develop Linux device drivers

Understanding the Linux Kernel Sep 08 2021 To thoroughly understand what makes Linux tick and why it's so efficient, you need to delve deep into the heart of the operating system--into the Linux kernel itself. The kernel is Linux--in the case of the Linux operating system, it's the only bit of software to which the term "Linux" applies. The kernel handles all the requests or completed I/O operations and determines which programs will share its processing time, and in what order. Responsible for the sophisticated memory management of the whole system, the Linux kernel is the force behind the legendary Linux efficiency. The new edition of Understanding the Linux Kernel takes you on a guided tour through the most significant data structures, many algorithms, and programming tricks used in the kernel. Probing beyond the superficial features, the authors offer valuable insights to people who want to know how things really work inside their machine. Relevant segments of code are dissected and discussed line by line. The book covers more than just the functioning of the code, it explains the theoretical underpinnings for why Linux does things the way it does. The new edition of the book has been updated to cover version 2.4 of the kernel, which is quite different from version 2.2: the virtual memory system is entirely new, support for multiprocessor systems is improved, and whole new classes of hardware devices have been added. The authors explore each new feature in detail. Other topics in the book include: Memory management including file buffering, process swapping, and Direct memory Access (DMA) The Virtual Filesystem and the Second Extended Filesystem Process creation and scheduling Signals, interrupts, and the essential interfaces to device drivers Timing Synchronization in the kernel

Interprocess Communication (IPC) Program execution Understanding the Linux Kernel, Second Edition will acquaint you with all the inner workings of Linux, but is more than just an academic exercise. You'll learn what conditions bring out Linux's best performance, and you'll see how it meets the challenge of providing good system response during process scheduling, file access, and memory management in a wide variety of environments. If knowledge is power, then this book will help you make the most of your Linux system.

Professional Linux Kernel Architecture Mar 15 2022 Find an introduction to the architecture, concepts and algorithms of the Linux kernel in Professional Linux Kernel Architecture, a guide to the kernel sources and large number of connections among subsystems. Find an introduction to the relevant structures and functions exported by the kernel to userland, understand the theoretical and conceptual aspects of the Linux kernel and Unix derivatives, and gain a deeper understanding of the kernel. Learn how to reduce the vast amount of information contained in the kernel sources and obtain the skills necessary to understand the kernel sources.

Linux Device Drivers Jan 01 2021 Device drivers literally drive everything you're interested in--disks, monitors, keyboards, modems--everything outside the computer chip and memory. And writing device drivers is one of the few areas of programming for the Linux operating system that calls for unique, Linux-specific knowledge. For years now, programmers have relied on the classic Linux Device Drivers from O'Reilly to master this critical subject. Now in its third edition, this bestselling guide provides all the information you'll need to write drivers for a wide range of devices. Over the years the book has helped countless programmers learn: how to support computer peripherals under the Linux operating system how to develop and write software for new hardware under Linux the basics of Linux operation even if they are not expecting to write a driver The new edition of Linux

Device Drivers is better than ever. The book covers all the significant changes to Version 2.6 of the Linux kernel, which simplifies many activities, and contains subtle new features that can make a driver both more efficient and more flexible. Readers will find new chapters on important types of drivers not covered previously, such as consoles, USB drivers, and more. Best of all, you don't have to be a kernel hacker to understand and enjoy this book. All you need is an understanding of the C programming language and some background in Unix system calls. And for maximum ease-of-use, the book uses full-featured examples that you can compile and run without special hardware. Today Linux holds fast as the most rapidly growing segment of the computer market and continues to win over enthusiastic adherents in many application areas. With this increasing support, Linux is now absolutely mainstream, and viewed as a solid platform for embedded systems. If you're writing device drivers, you'll want this book. In fact, you'll wonder how drivers are ever written without it.

Mastering Embedded Linux Programming Oct 10 2021 Master the techniques needed to build great, efficient embedded devices on Linux About This Book Discover how to build and configure reliable embedded Linux devices This book has been updated to include Linux 4.9 and Yocto Project 2.2 (Morty) This comprehensive guide covers the remote update of devices in the field and power management Who This Book Is For If you are an engineer who wishes to understand and use Linux in embedded devices, this book is for you. It is also for Linux developers and system programmers who are familiar with embedded systems and want to learn and program the best in class devices. It is appropriate for students studying embedded techniques, for developers implementing embedded Linux devices, and engineers supporting existing Linux devices. What You Will Learn Evaluate the Board Support Packages offered by most manufacturers of a system on chip or embedded module Use Buildroot and the Yocto Project to create embedded Linux systems quickly and efficiently

Update IoT devices in the field without compromising security Reduce the power budget of devices to make batteries last longer Interact with the hardware without having to write kernel device drivers Debug devices remotely using GDB, and see how to measure the performance of the systems using powerful tools such as `perf`, `ftrace`, and `valgrind` Find out how to configure Linux as a real-time operating system In Detail Embedded Linux runs many of the devices we use every day, from smart TVs to WiFi routers, test equipment to industrial controllers - all of them have Linux at their heart. Linux is a core technology in the implementation of the inter-connected world of the Internet of Things. The comprehensive guide shows you the technologies and techniques required to build Linux into embedded systems. You will begin by learning about the fundamental elements that underpin all embedded Linux projects: the toolchain, the bootloader, the kernel, and the root filesystem. You'll see how to create each of these elements from scratch, and how to automate the process using Buildroot and the Yocto Project. Moving on, you'll find out how to implement an effective storage strategy for flash memory chips, and how to install updates to the device remotely once it is deployed. You'll also get to know the key aspects of writing code for embedded Linux, such as how to access hardware from applications, the implications of writing multi-threaded code, and techniques to manage memory in an efficient way. The final chapters show you how to debug your code, both in applications and in the Linux kernel, and how to profile the system so that you can look out for performance bottlenecks. By the end of the book, you will have a complete overview of the steps required to create a successful embedded Linux system. Style and approach This book is an easy-to-follow and pragmatic guide with in-depth analysis of the implementation of embedded devices. It follows the life cycle of a project from inception through to completion, at each stage giving both the theory that underlies the topic and practical step-by-step walkthroughs of an

example implementation.

Mastering Linux Device Driver Development Sep 20 2022 Master the art of developing customized device drivers for your embedded Linux systems Key Features Stay up to date with the Linux PCI, ASoC, and V4L2 subsystems and write device drivers for them Get to grips with the Linux kernel power management infrastructure Adopt a practical approach to customizing your Linux environment using best practices Book Description Linux is one of the fastest-growing operating systems around the world, and in the last few years, the Linux kernel has evolved significantly to support a wide variety of embedded devices with its improved subsystems and a range of new features. With this book, you'll find out how you can enhance your skills to write custom device drivers for your Linux operating system. Mastering Linux Device Driver Development provides complete coverage of kernel topics, including video and audio frameworks, that usually go unaddressed. You'll work with some of the most complex and impactful Linux kernel frameworks, such as PCI, ALSA for SoC, and Video4Linux2, and discover expert tips and best practices along the way. In addition to this, you'll understand how to make the most of frameworks such as NVMEM and Watchdog. Once you've got to grips with Linux kernel helpers, you'll advance to working with special device types such as Multi-Function Devices (MFD) followed by video and audio device drivers. By the end of this book, you'll be able to write feature-rich device drivers and integrate them with some of the most complex Linux kernel frameworks, including V4L2 and ALSA for SoC. What you will learn Explore and adopt Linux kernel helpers for locking, work deferral, and interrupt management Understand the Regmap subsystem to manage memory accesses and work with the IRQ subsystem Get to grips with the PCI subsystem and write reliable drivers for PCI devices Write full multimedia device drivers using ALSA SoC and the V4L2 framework Build power-aware device

drivers using the kernel power management framework Find out how to get the most out of miscellaneous kernel subsystems such as NVMEM and Watchdog Who this book is for This book is for embedded developers, Linux system engineers, and system programmers who want to explore Linux kernel frameworks and subsystems. C programming skills and a basic understanding of driver development are necessary to get started with this book.

Essential Linux Device Drivers Nov 22 2022 “Probably the most wide ranging and complete Linux device driver book I’ve read.” --Alan Cox, Linux Guru and Key Kernel Developer “Very comprehensive and detailed, covering almost every single Linux device driver type.” --Theodore Ts’o, First Linux Kernel Developer in North America and Chief Platform Strategist of the Linux Foundation The Most Practical Guide to Writing Linux Device Drivers Linux now offers an exceptionally robust environment for driver development: with today’s kernels, what once required years of development time can be accomplished in days. In this practical, example-driven book, one of the world’s most experienced Linux driver developers systematically demonstrates how to develop reliable Linux drivers for virtually any device. Essential Linux Device Drivers is for any programmer with a working knowledge of operating systems and C, including programmers who have never written drivers before. Sreekrishnan Venkateswaran focuses on the essentials, bringing together all the concepts and techniques you need, while avoiding topics that only matter in highly specialized situations. Venkateswaran begins by reviewing the Linux 2.6 kernel capabilities that are most relevant to driver developers. He introduces simple device classes; then turns to serial buses such as I2C and SPI; external buses such as PCMCIA, PCI, and USB; video, audio, block, network, and wireless device drivers; user-space drivers; and drivers for embedded Linux—one of today’s fastest growing areas of Linux development. For each, Venkateswaran explains the technology, inspects

relevant kernel source files, and walks through developing a complete example. • Addresses drivers discussed in no other book, including drivers for I2C, video, sound, PCMCIA, and different types of flash memory • Demystifies essential kernel services and facilities, including kernel threads and helper interfaces • Teaches polling, asynchronous notification, and I/O control • Introduces the Inter-Integrated Circuit Protocol for embedded Linux drivers • Covers multimedia device drivers using the Linux-Video subsystem and Linux-Audio framework • Shows how Linux implements support for wireless technologies such as Bluetooth, Infrared, WiFi, and cellular networking • Describes the entire driver development lifecycle, through debugging and maintenance • Includes reference appendixes covering Linux assembly, BIOS calls, and Seq files

Linux Device Drivers May 29 2023 Provides "hands-on" information on writing device drivers for the Linux system, with particular focus on the features of the 2.4 kernel and its implementation

Embedded Linux Primer May 17 2022 Up-to-the-Minute, Complete Guidance for Developing Embedded Solutions with Linux Linux has emerged as today's #1 operating system for embedded products. Christopher Hallinan's Embedded Linux Primer has proven itself as the definitive real-world guide to building efficient, high-value, embedded systems with Linux. Now, Hallinan has thoroughly updated this highly praised book for the newest Linux kernels, capabilities, tools, and hardware support, including advanced multicore processors. Drawing on more than a decade of embedded Linux experience, Hallinan helps you rapidly climb the learning curve, whether you're moving from legacy environments or you're new to embedded programming. Hallinan addresses today's most important development challenges and demonstrates how to solve the problems you're most likely to encounter. You'll learn how to build a modern, efficient embedded Linux development environment, and then utilize it as productively as possible. Hallinan offers up-to-date guidance on

everything from kernel configuration and initialization to bootloaders, device drivers to file systems, and BusyBox utilities to real-time configuration and system analysis. This edition adds entirely new chapters on UDEV, USB, and open source build systems. Tour the typical embedded system and development environment and understand its concepts and components. Understand the Linux kernel and userspace initialization processes. Preview bootloaders, with specific emphasis on U-Boot. Configure the Memory Technology Devices (MTD) subsystem to interface with flash (and other) memory devices. Make the most of BusyBox and latest open source development tools. Learn from expanded and updated coverage of kernel debugging. Build and analyze real-time systems with Linux. Learn to configure device files and driver loading with UDEV. Walk through detailed coverage of the USB subsystem. Introduces the latest open source embedded Linux build systems. Reference appendices include U-Boot and BusyBox commands.

Linux Kernel and Driver Development - Practical Labs Jul 27 2020 This book contains the practical labs corresponding to the "Linux Kernel and Driver Development: Training Handouts" book from Bootlin. Get your hands on an embedded board based on an ARM processor (the Beagle Bone Black board), and apply what you learned: write a Device Tree to declare devices connected to your board, configure pin multiplexing, and implement drivers for I2C and serial devices. You will learn how to manage multiple devices with the same driver, to access and write hardware registers, to allocate memory, to register and manage interrupts, as well as how to debug your code and interpret the kernel error messages. You will also keep an eye on the board and CPU datasheets so that you will always understand the values that you feed to the kernel.

Linux Device Drivers Sep 01 2023 Provides information on writing a driver in Linux, covering such topics as character devices, network interfaces, driver debugging, concurrency, and interrupts.

FreeBSD Device Drivers Oct 22 2022 Device drivers make it possible for your software to communicate with your hardware, and because every operating system has specific requirements, driver writing is nontrivial. When developing for FreeBSD, you've probably had to scour the Internet and dig through the kernel sources to figure out how to write the drivers you need. Thankfully, that stops now. In FreeBSD Device Drivers, Joseph Kong will teach you how to master everything from the basics of building and running loadable kernel modules to more complicated topics like thread synchronization. After a crash course in the different FreeBSD driver frameworks, extensive tutorial sections dissect real-world drivers like the parallel port printer driver. You'll learn: -All about Newbus, the infrastructure used by FreeBSD to manage the hardware devices on your system -How to work with ISA, PCI, USB, and other buses -The best ways to control and communicate with the hardware devices from user space -How to use Direct Memory Access (DMA) for maximum system performance -The inner workings of the virtual null modem terminal driver, the USB printer driver, the Intel PCI Gigabit Ethernet adapter driver, and other important drivers -How to use Common Access Method (CAM) to manage host bus adapters (HBAs) Concise descriptions and extensive annotations walk you through the many code examples. Don't waste time searching man pages or digging through the kernel sources to figure out how to make that arcane bit of hardware work with your system. FreeBSD Device Drivers gives you the framework that you need to write any driver you want, now.

Dadgum That's Good May 05 2021 Since 1973, the McLemore family business, Masterbuilt, has developed cooking products and recipes to make your life simple. Dadgum That's Good! brings you more than 125 professionally-tested smoking, grilling, frying, boiling and steaming recipes, including 16 of John McLemore's signature recipes. Plus you'll find tips on: how to choose cuts of

meat, fish, and poultry, keeping your pantry stocked with essential items, and getting the most out of your ingredients.

Exploring Raspberry Pi Jul 07 2021 Expand Raspberry Pi capabilities with fundamental engineering principles Exploring Raspberry Pi is the innovators guide to bringing Raspberry Pi to life. This book favors engineering principles over a 'recipe' approach to give you the skills you need to design and build your own projects. You'll understand the fundamental principles in a way that transfers to any type of electronics, electronic modules, or external peripherals, using a "learning by doing" approach that caters to both beginners and experts. The book begins with basic Linux and programming skills, and helps you stock your inventory with common parts and supplies. Next, you'll learn how to make parts work together to achieve the goals of your project, no matter what type of components you use. The companion website provides a full repository that structures all of the code and scripts, along with links to video tutorials and supplementary content that takes you deeper into your project. The Raspberry Pi's most famous feature is its adaptability. It can be used for thousands of electronic applications, and using the Linux OS expands the functionality even more. This book helps you get the most from your Raspberry Pi, but it also gives you the fundamental engineering skills you need to incorporate any electronics into any project. Develop the Linux and programming skills you need to build basic applications Build your inventory of parts so you can always "make it work" Understand interfacing, controlling, and communicating with almost any component Explore advanced applications with video, audio, real-world interactions, and more Be free to adapt and create with Exploring Raspberry Pi.

Linux Kernel Programming Part 2 - Char Device Drivers and Kernel Synchronization Jun 29 2023 Discover how to write high-quality character driver code, interface with userspace, work with chip

memory, and gain an in-depth understanding of working with hardware interrupts and kernel synchronization

Key Features

- Delve into hardware interrupt handling, threaded IRQs, tasklets, softirqs, and understand which to use when
- Explore powerful techniques to perform user-kernel interfacing, peripheral I/O and use kernel mechanisms
- Work with key kernel synchronization primitives to solve kernel concurrency issues

Book Description

Linux Kernel Programming Part 2 - Char Device Drivers and Kernel Synchronization is an ideal companion guide to the Linux Kernel Programming book. This book provides a comprehensive introduction for those new to Linux device driver development and will have you up and running with writing misc class character device driver code (on the 5.4 LTS Linux kernel) in next to no time. You'll begin by learning how to write a simple and complete misc class character driver before interfacing your driver with user-mode processes via procfs, sysfs, debugfs, netlink sockets, and ioctl. You'll then find out how to work with hardware I/O memory. The book covers working with hardware interrupts in depth and helps you understand interrupt request (IRQ) allocation, threaded IRQ handlers, tasklets, and softirqs. You'll also explore the practical usage of useful kernel mechanisms, setting up delays, timers, kernel threads, and workqueues. Finally, you'll discover how to deal with the complexity of kernel synchronization with locking technologies (mutexes, spinlocks, and atomic/refcount operators), including more advanced topics such as cache effects, a primer on lock-free techniques, deadlock avoidance (with lockdep), and kernel lock debugging techniques. By the end of this Linux kernel book, you'll have learned the fundamentals of writing Linux character device driver code for real-world projects and products.

What you will learn

- Get to grips with the basics of the modern Linux Device Model (LDM)
- Write a simple yet complete misc class character device driver
- Perform user-kernel interfacing using popular methods
- Understand and handle hardware interrupts confidently
- Perform I/O on peripheral hardware

chip memoryExplore kernel APIs to work with delays, timers, kthreads, and workqueuesUnderstand kernel concurrency issuesWork with key kernel synchronization primitives and discover how to detect and avoid deadlockWho this book is for An understanding of the topics covered in the Linux Kernel Programming book is highly recommended to make the most of this book. This book is for Linux programmers beginning to find their way with device driver development. Linux device driver developers looking to overcome frequent and common kernel/driver development issues, as well as perform common driver tasks such as user-kernel interfaces, performing peripheral I/O, handling hardware interrupts, and dealing with concurrency will benefit from this book. A basic understanding of Linux kernel internals (and common APIs), kernel module development, and C programming is required.

Advanced Linux Programming Jan 13 2022 This is the eBook version of the printed book. If the print book includes a CD-ROM, this content is not included within the eBook version. Advanced Linux Programming is divided into two parts. The first covers generic UNIX system services, but with a particular eye towards Linux specific information. This portion of the book will be of use even to advanced programmers who have worked with other Linux systems since it will cover Linux specific details and differences. For programmers without UNIX experience, it will be even more valuable. The second section covers material that is entirely Linux specific. These are truly advanced topics, and are the techniques that the gurus use to build great applications. While this book will focus mostly on the Application Programming Interface (API) provided by the Linux kernel and the C library, a preliminary introduction to the development tools available will allow all who purchase the book to make immediate use of Linux.

Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow Nov 30 2020 Through a

series of recent breakthroughs, deep learning has boosted the entire field of machine learning. Now, even programmers who know close to nothing about this technology can use simple, efficient tools to implement programs capable of learning from data. This practical book shows you how. By using concrete examples, minimal theory, and two production-ready Python frameworks—Scikit-Learn and TensorFlow—author Aurélien Géron helps you gain an intuitive understanding of the concepts and tools for building intelligent systems. You'll learn a range of techniques, starting with simple linear regression and progressing to deep neural networks. With exercises in each chapter to help you apply what you've learned, all you need is programming experience to get started. Explore the machine learning landscape, particularly neural nets Use Scikit-Learn to track an example machine-learning project end-to-end Explore several training models, including support vector machines, decision trees, random forests, and ensemble methods Use the TensorFlow library to build and train neural nets Dive into neural net architectures, including convolutional nets, recurrent nets, and deep reinforcement learning Learn techniques for training and scaling deep neural nets

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