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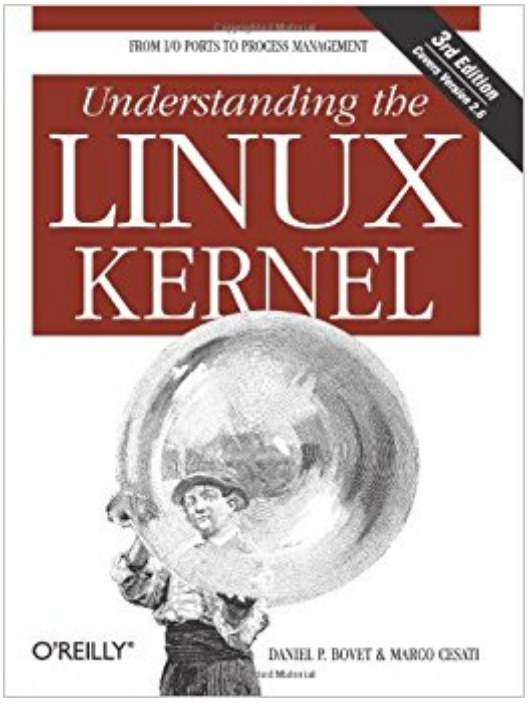
Understanding The Linux Kernel, Third Edition



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Synopsis

In order to thoroughly understand what makes Linux tick and why it works so well on a wide variety of systems, you need to delve deep into the heart of the kernel. The kernel handles all interactions between the CPU and the external world, and determines which programs will share processor time, in what order. It manages limited memory so well that hundreds of processes can share the system efficiently, and expertly organizes data transfers so that the CPU isn't kept waiting any longer than necessary for the relatively slow disks.The third edition of Understanding the Linux Kernel takes you on a guided tour of the most significant data structures, algorithms, and programming tricks used in the kernel. Probing beyond superficial features, the authors offer valuable insights to people who want to know how things really work inside their machine. Important Intel-specific features are discussed. Relevant segments of code are dissected line by line. But the book covers more than just the functioning of the code; it explains the theoretical underpinnings of why Linux does things the way it does.This edition of the book covers Version 2.6, which has seen significant changes to nearly every kernel subsystem, particularly in the areas of memory management and block devices. The book focuses on the following topics:Memory management, including file buffering, process swapping, and Direct memory Access (DMA) The Virtual Filesystem layer and the Second and Third Extended FilesystemsProcess creation and schedulingSignals, interrupts, and the essential interfaces to device driversTimingSynchronization within the kernelInterprocess Communication (IPC) Program executionUnderstanding the Linux Kernel will acquaint you with all the inner workings of Linux, but it's 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. This book will help you make the most of your Linux system.

Book Information

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Customer Reviews

This book deserves three stars for the following reasons: The three stars come from: 1.) The book does walk you through from the higher level kernel functions all the way to what happens to x86 register set during a process switch (....these details constitute the 'soul' of an OS IMHO). So you can gain some insight in how the 'naked' iron (x86) is made into a higher level LINUX virtual machine (using Tannenbaum's analogy). 2.) The book contains a tremendous wealth of information, far more than most of the other few and far between titles on the subject 3.) The book covers the aforementioned info in far more detail than most of the other few and far between titles on the subject The remaining two stars were not given because: 4.) The information in the book is organized in _the_ most haphazard and unorganized way possible....scattered all over the place with lot's of cross-references. 5.) There is a lack of effort (or perhaps ability ?) on the part of the authors to properly explain things. The information is presented more akin to a 'core -dump' of their brains. It's like "here are the facts folks.... ...you work it out on your own". Complex relationships and concepts are explained without the use of any didactics whatsoever. Each chapter is mostly just a statement of facts following one after the other ..."here is 'struct task_struct'.. it has member 'sighand' ..." e.t.c.Sure I worked my way through a lot of the information and `grepped`a lot of source code and found a lot of additional detail andinfo regarding the kernel all by myself..(.

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