
Linux Performance Tools Brendan Gregg

DTrace

Performance Analysis and Tuning on Modern CPUs

Debugging Linux Systems (Digital Short Cut)

Linux Observability with BPF

Camel Design Patterns

Cybersecurity Attacks - Red Team Strategies

Database Internals

High Performance Web Sites

Optimizing Java

Mastering KVM Virtualization

Java Performance Tuning

Programming Rust

Systems Performance

The Art of Capacity Planning

Systems Performance

Hello, Startup

Modern X86 Assembly Language Programming

Pro .NET Benchmarking

The Art of Linux Kernel Design

Solaris" Performance And Tools: Dtrace And Mdb Techniques For Solaris 10 And

Opensolaris

Problem-solving in High Performance Computing

Optimizing Oracle Performance

BPF Performance Tools

Linux System Programming

Linkers and Loaders

Essential Linux Device Drivers

BPF Performance Tools

Embedded Android

Performance Solutions

Implementing Service Level Objectives

Understanding Software Dynamics

Mastering Embedded Linux Programming

Hands-On System Programming with Linux

Solaris Internals

Cloud Native DevOps with Kubernetes
Linux Kernel Programming
High Performance Browser Networking
Lions' Commentary on UNIX 6th Edition with Source Code
Data Plane Development Kit (DPDK)

Linux Performance Tools Brendan Gregg
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DTrace "O'Reilly Media, Inc."
Use BPF Tools to Optimize Performance, Fix Problems, and See Inside Running Systems BPF-based performance tools give you unprecedented visibility into systems and

applications, so you can optimize performance, troubleshoot code, strengthen security, and reduce costs. BPF Performance Tools: Linux System and Application Observability is the definitive guide to using these tools for observability. Pioneering BPF expert Brendan Gregg presents more than 150 ready-to-run analysis

and debugging tools, expert guidance on applying them, and step-by-step tutorials on developing your own. You'll learn how to analyze CPUs, memory, disks, file systems, networking, languages, applications, containers, hypervisors, security, and the kernel. Gregg guides you from basic to advanced tools, helping

you generate deeper, more useful technical insights for improving virtually any Linux system or application. * Learn essential tracing concepts and both core BPF front-ends: BCC and bpftrace * Master 150+ powerful BPF tools, including dozens created just for this book, and available for download * Discover practical strategies, tips, and tricks for more effective analysis * Analyze compiled, JIT-compiled, and interpreted code in multiple languages: C, Java, bash

shell, and more * Generate metrics, stack traces, and custom latency histograms * Use complementary tools when they offer quick, easy wins * Explore advanced tools built on BPF: PCP and Grafana for remote monitoring, eBPF Exporter, and kubectl-trace for tracing Kubernetes * Foreword by Alexei Starovoitov, creator of the new BPF BPF Performance Tools will be an indispensable resource for all administrators, developers, support staff, and other IT professionals

working with any recent Linux distribution in any enterprise or cloud environment.

Performance Analysis and Tuning on Modern CPUs

"O'Reilly Media, Inc."

BPF Performance

Tools Addison-Wesley

Professional

Debugging Linux Systems

(Digital Short Cut) CRC

Press

Although service-level objectives (SLOs) continue to grow in importance, there's a distinct lack of information about how to implement them. Practical

advice that does exist usually assumes that your team already has the infrastructure, tooling, and culture in place. In this book, recognized SLO expert Alex Hidalgo explains how to build an SLO culture from the ground up. Ideal as a primer and daily reference for anyone creating both the culture and tooling necessary for SLO-based approaches to reliability, this guide provides detailed analysis of advanced SLO and service-level indicator (SLI) techniques. Armed

with mathematical models and statistical knowledge to help you get the most out of an SLO-based approach, you'll learn how to build systems capable of measuring meaningful SLIs with buy-in across all departments of your organization. Define SLIs that meaningfully measure the reliability of a service from a user's perspective Choose appropriate SLO targets, including how to perform statistical and probabilistic analysis Use error budgets to help your team have better

discussions and make better data-driven decisions Build supportive tooling and resources required for an SLO-based approach Use SLO data to present meaningful reports to leadership and your users

Linux Observability with BPF "O'Reilly Media, Inc."

Systems programming provides the foundation for the world's computation. Writing performance-sensitive code requires a programming language that puts programmers in

control of how memory, processor time, and other system resources are used. The Rust systems programming language combines that control with a modern type system that catches broad classes of common mistakes, from memory management errors to data races between threads. With this practical guide, experienced systems programmers will learn how to successfully bridge the gap between performance and safety using Rust. Jim Blandy,

Jason Orendorff, and Leonora Tindall demonstrate how Rust's features put programmers in control over memory consumption and processor use by combining predictable performance with memory safety and trustworthy concurrency. You'll learn: Rust's fundamental data types and the core concepts of ownership and borrowing How to write flexible, efficient code with traits and generics How to write fast, multithreaded code without data races Rust's

key power tools: closures, iterators, and asynchronous programming Collections, strings and text, input and output, macros, unsafe code, and foreign function interfaces This revised, updated edition covers the Rust 2021 Edition. *Camel Design Patterns* Prentice Hall Build your expertise in the BPF virtual machine in the Linux kernel with this practical guide for systems engineers. You'll not only dive into the BPF program lifecycle but also learn to write applications

that observe and modify the kernel's behavior; inject code to monitor, trace, and securely observe events in the kernel; and more. Authors David Calavera and Lorenzo Fontana help you harness the power of BPF to make any computing system more observable. Familiarize yourself with the essential concepts you'll use on a day-to-day basis and augment your knowledge about performance optimization, networking, and security. Then see how it all comes together with code

examples in C, Go, and Python. Write applications that use BPF to observe and modify the Linux kernel's behavior on demand Inject code to monitor, trace, and observe events in the kernel in a secure way—no need to recompile the kernel or reboot the system Explore code examples in C, Go, and Python Gain a more thorough understanding of the BPF program lifecycle
Cybersecurity Attacks - Red Team Strategies
Morgan Kaufmann

Gain the fundamentals of x86 64-bit assembly language programming and focus on the updated aspects of the x86 instruction set that are most relevant to application software development. This book covers topics including x86 64-bit programming and Advanced Vector Extensions (AVX) programming. The focus in this second edition is exclusively on 64-bit base programming architecture and AVX programming. Modern X86 Assembly Language Programming's

structure and sample code are designed to help you quickly understand x86 assembly language programming and the computational capabilities of the x86 platform. After reading and using this book, you'll be able to code performance-enhancing functions and algorithms using x86 64-bit assembly language and the AVX, AVX2 and AVX-512 instruction set extensions. What You Will Learn Discover details of the x86 64-bit platform including its core architecture, data types,

registers, memory addressing modes, and the basic instruction set Use the x86 64-bit instruction set to create performance-enhancing functions that are callable from a high-level language (C++) Employ x86 64-bit assembly language to efficiently manipulate common data types and programming constructs including integers, text strings, arrays, and structures Use the AVX instruction set to perform scalar floating-point arithmetic Exploit the AVX, AVX2, and

AVX-512 instruction sets to significantly accelerate the performance of computationally-intense algorithms in problem domains such as image processing, computer graphics, mathematics, and statistics Apply various coding strategies and techniques to optimally exploit the x86 64-bit, AVX, AVX2, and AVX-512 instruction sets for maximum possible performance Who This Book Is For Software developers who want to learn how to write code using x86 64-bit assembly

language. It's also ideal for software developers who already have a basic understanding of x86 32-bit or 64-bit assembly language programming and are interested in learning how to exploit the SIMD capabilities of AVX, AVX2 and AVX-512. *Database Internals* "O'Reilly Media, Inc." For the past 20 years, UNIX insiders have cherished and zealously guarded pirated photocopies of this manuscript, a "hacker trophy" of sorts. Now legal (and legible) copies are

available. An international "who's who" of UNIX wizards, including Dennis Ritchie, have contributed essays extolling the merits and importance of this underground classic. [High Performance Web Sites](#) Pearson Education Success on the web is measured by usage and growth. Web-based companies live or die by the ability to scale their infrastructure to accommodate increasing demand. This book is a hands-on and practical guide to planning for such growth, with many

techniques and considerations to help you plan, deploy, and manage web application infrastructure. *The Art of Capacity Planning* is written by the manager of data operations for the world-famous photo-sharing site Flickr.com, now owned by Yahoo! John Allspaw combines personal anecdotes from many phases of Flickr's growth with insights from his colleagues in many other industries to give you solid guidelines for measuring your growth, predicting trends, and

making cost-effective preparations. Topics include: Evaluating tools for measurement and deployment Capacity analysis and prediction for storage, database, and application servers Designing architectures to easily add and measure capacity Handling sudden spikes Predicting exponential and explosive growth How cloud services such as EC2 can fit into a capacity strategy In this book, Allspaw draws on years of valuable experience, starting from the days

when Flickr was relatively small and had to deal with the typical growth pains and cost/performance trade-offs of a typical company with a Web presence. The advice he offers in *The Art of Capacity Planning* will not only help you prepare for explosive growth, it will save you tons of grief. **Optimizing Java** Packt Publishing Ltd Kubernetes is the operating system of the cloud native world, providing a reliable and scalable platform for running containerized

workloads. In this friendly, pragmatic book, cloud experts John Arundel and Justin Domingus show you what Kubernetes can do—and what you can do with it. You'll learn all about the Kubernetes ecosystem, and use battle-tested solutions to everyday problems. You'll build, step by step, an example cloud native application and its supporting infrastructure, along with a development environment and continuous deployment pipeline that you can use for your own applications.

Understand containers and Kubernetes from first principles; no experience necessary Run your own clusters or choose a managed Kubernetes service from Amazon, Google, and others Use Kubernetes to manage resource usage and the container lifecycle Optimize clusters for cost, performance, resilience, capacity, and scalability Learn the best tools for developing, testing, and deploying your applications Apply the latest industry practices for security, observability,

and monitoring Adopt DevOps principles to help make your development teams lean, fast, and effective Mastering KVM Virtualization "O'Reilly Media, Inc." Performance tuning is becoming more important than it has been for the last 40 years. Read this book to understand your application's performance that runs on a modern CPU and learn how you can improve it. The 170+ page guide combines the knowledge of many optimization experts from

different industries. **Java Performance Tuning** CRC Press This title provides systematic performance planning techniques for diverse computing environments and architectures. It seeks to smoothly integrate performance analysis into an existing software development process. Addison-Wesley Professional Company This book is the "Hello, World" tutorial for building products, technologies, and teams in a startup environment. It's based

on the experiences of the author, Yevgeniy (Jim) Brikman, as well as interviews with programmers from some of the most successful startups of the last decade, including Google, Facebook, LinkedIn, Twitter, GitHub, Stripe, Instagram, AdMob, Pinterest, and many others. Hello, Startup is a practical, how-to guide that consists of three parts: Products, Technologies, and Teams. Although at its core, this is a book for programmers, by

programmers, only Part II (Technologies) is significantly technical, while the rest should be accessible to technical and non-technical audiences alike. If you're at all interested in startups—whether you're a programmer at the beginning of your career, a seasoned developer bored with large company politics, or a manager looking to motivate your engineers—this book is for you.

Programming Rust

Pearson
When it comes to

choosing, using, and maintaining a database, understanding its internals is essential. But with so many distributed databases and tools available today, it's often difficult to understand what each one offers and how they differ. With this practical guide, Alex Petrov guides developers through the concepts behind modern database and storage engine internals. Throughout the book, you'll explore relevant material gleaned from numerous books, papers, blog posts, and

the source code of several open source databases. These resources are listed at the end of parts one and two. You'll discover that the most significant distinctions among many modern databases reside in subsystems that determine how storage is organized and how data is distributed. This book examines: Storage engines: Explore storage classification and taxonomy, and dive into B-Tree-based and immutable Log Structured storage engines, with differences and use-cases

for each Storage building blocks: Learn how database files are organized to build efficient storage, using auxiliary data structures such as Page Cache, Buffer Pool and Write-Ahead Log Distributed systems: Learn step-by-step how nodes and processes connect and build complex communication patterns Database clusters: Which consistency models are commonly used by modern databases and how distributed storage systems achieve

consistency
Systems Performance
Pearson Education
Helps readers eliminate performance problems, covering topics including bottlenecks, profiling tools, strings, algorithms, distributed systems, and servlets.

The Art of Capacity Planning Pearson Education

Troubleshoot and Optimize Complex, Time-Constrained Software From mobile and cloud apps to video games to driverless vehicle control, more and more software

is time-constrained: It must deliver reliable results seamlessly, consistently, and virtually instantaneously. If it doesn't, customers are unhappy--and sometimes lives are put at risk. When time-constrained software underperforms or fails, software professionals must quickly identify and address the root causes. This is difficult and, historically, few tools have been available to help. In *Understanding Software Dynamics*, performance expert Richard L. Sites tackles the problem head

on, offering expert methods and advanced tools for understanding complex time-constrained software dynamics, improving reliability, and troubleshooting challenging performance problems. Sites draws on several decades of experience pioneering software performance optimization, as well as extensive experience teaching graduate-level developers. He introduces principles and techniques for use in any environment, from embedded devices to

datacenters, illuminating them with examples based on x86 or ARM processors running Linux and linked by Ethernet. He also guides readers through building and applying a powerful, new, extremely low-overhead open-source software tool, KUtrace, to precisely trace executions on every CPU core. Using insights gleaned from this tool, readers can apply nuanced solutions--not merely brute-force techniques such as turning off caches or cores. Measure and

address issues associated with CPUs, memory, disk/SSD, networks, and their interactions Fix programs that are always too slow, and those that sometimes lag for no apparent reason Design useful observability, logging, and time-stamping capabilities into your code Reason more effectively about performance data to see why reality differs from expectations Identify problems such as excess execution, slow instruction execution, waiting for resources, and

software locks Understanding Software Dynamics will be valuable to experienced software professionals, including application and OS developers, hardware and system architects, real-time system designers, and game developers, as well as advanced students. Register your book for convenient access to downloads, updates, and/or corrections as they become available. See inside book for details. [Systems Performance](#) Peer to Peer

Communications Want your web site to display more quickly? This book presents 14 specific rules that will cut 25% to 50% off response time when users request a page. Author Steve Souders, in his job as Chief Performance Yahoo!, collected these best practices while optimizing some of the most-visited pages on the Web. Even sites that had already been highly optimized, such as Yahoo! Search and the Yahoo! Front Page, were able to benefit from these

surprisingly simple performance guidelines. The rules in High Performance Web Sites explain how you can optimize the performance of the Ajax, CSS, JavaScript, Flash, and images that you've already built into your site -- adjustments that are critical for any rich web application. Other sources of information pay a lot of attention to tuning web servers, databases, and hardware, but the bulk of display time is taken up on the browser side and by the communication

between server and browser. High Performance Web Sites covers every aspect of that process. Each performance rule is supported by specific examples, and code snippets are available on the book's companion web site. The rules include how to: Make Fewer HTTP Requests Use a Content Delivery Network Add an Expires Header Gzip Components Put Stylesheets at the Top Put Scripts at the Bottom Avoid CSS Expressions Make JavaScript and CSS

External Reduce DNS Lookups Minify JavaScript Avoid Redirects Remove Duplicates Scripts Configure ETags Make Ajax Cacheable If you're building pages for high traffic destinations and want to optimize the experience of users visiting your site, this book is indispensable. "If everyone would implement just 20% of Steve's guidelines, the Web would be a dramatically better place. Between this book and Steve's YSlow extension, there's really no

excuse for having a sluggish web site anymore." -Joe Hewitt, Developer of Firebug debugger and Mozilla's DOM Inspector "Steve Souders has done a fantastic job of distilling a massive, semi-arcane art down to a set of concise, actionable, pragmatic engineering steps that will change the world of web performance." -Eric Lawrence, Developer of the Fiddler Web Debugger, Microsoft Corporation
Hello, Startup BPF Performance Tools

This book brings together the insights and practical experience of some of the most experienced Data Plane Development Kit (DPDK) technical experts, detailing the trend of DPDK, data packet processing, hardware acceleration, packet processing and virtualization, as well as the practical application of DPDK in the fields of SDN, NFV, and network storage. The book also devotes many chunks to exploring various core software algorithms, the advanced optimization

methods adopted in DPDK, detailed practical experience, and the guides on how to use DPDK.

Modern X86 Assembly Language Programming
Addison-Wesley Professional

"I enjoyed reading this useful overview of the techniques and challenges of implementing linkers and loaders. While most of the examples are focused on three computer architectures that are widely used today, there are also many side

comments about interesting and quirky computer architectures of the past. I can tell from these war stories that the author really has been there himself and survived to tell the tale." - Guy Steele Whatever your programming language, whatever your platform, you probably tap into linker and loader functions all the time. But do you know how to use them to their greatest possible advantage? Only now, with the publication of *Linkers & Loaders*, is there an authoritative

book devoted entirely to these deep-seated compile-time and run-time processes. The book begins with a detailed and comparative account of linking and loading that illustrates the differences among various compilers and operating systems. On top of this foundation, the author presents clear practical advice to help you create faster, cleaner code. You'll learn to avoid the pitfalls associated with Windows DLLs, take advantage of the space-saving, performance-improving techniques

supported by many modern linkers, make the best use of the UNIX ELF library scheme, and much more. If you're serious about programming, you'll devour this unique guide to one of the field's least understood topics. *Linkers & Loaders* is also an ideal supplementary text for compiler and operating systems courses. Features: * Includes a linker construction project written in Perl, with project files available for download. * Covers dynamic linking in Windows, UNIX, Linux,

BeOS, and other operating systems. * Explains the Java linking model and how it figures in network applets and extensible Java code. * Helps you write more elegant and effective code, and build applications that compile, load, and run more efficiently.

Pro .NET Benchmarking

O'Reilly Media

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 primitives. Who 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. *The Art of Linux Kernel*

Design "O'Reilly Media, Inc." Oracle system performance inefficiencies often go undetected for months or even years--even under intense scrutiny--because traditional Oracle performance analysis methods and tools are fundamentally flawed. They're unreliable and inefficient. Oracle DBAs and developers are all too familiar with the outlay of time and resources, blown budgets, missed deadlines, and marginally effective performance

fiddling that is commonplace with traditional methods of Oracle performance tuning. In this crucial book, Cary Millsap, former VP of Oracle's System Performance Group, clearly and concisely explains how to use Oracle's response time statistics to diagnose and repair performance problems. Cary also shows how "queueing theory" can be applied to response time statistics to predict the impact of upgrades and other system

changes. Optimizing Oracle Performance eliminates the time-consuming, trial-and-error guesswork inherent in most conventional approaches to tuning. You can determine exactly where a system's performance problem is, and with equal importance, where it is not, in just a few minutes--even if the problem is several years old. Optimizing Oracle Performance cuts a path through the complexity of current tuning methods, and streamlines an

approach that focuses on optimization techniques that any DBA can use quickly and successfully to make noticeable--even dramatic--improvements. For example, the one thing database users care most about is response time. Naturally, DBAs focus much of their time and effort towards improving response time. But it is entirely too easy to spend hundreds of hours to improve important system metrics such as hit ratios, average latencies, and wait times, only to find

users are unable to perceive the difference. And an expensive hardware upgrade may not help either. It doesn't have to be that way. Technological advances have added impact, efficiency, measurability, predictive capacity, reliability, speed, and practicality to the science of Oracle performance optimization. Optimizing Oracle Performance shows you how to slash the frustration and expense associated with unraveling the true root cause of any type of

performance problem,
and reliably predict future

performance. The price of
this essential book will be
paid back in hours saved

the first time its methods
are used.

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