Systems Performance Enterprise Brendan Gregg

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The Art of Capacity Planning

The seminal guide to performance analysis, with new information and essential advice The Art of Computer Systems Performance Analysis is the essential guide to practical performance analysis tools and techniques. This easy to follow guide presents a unique blend of measurement, simulation, and modeling methods in a straightforward, problem-oriented fashion, and integrates essential queuing theory with data analysis, experimental design, and the most powerful tools in performance analysis. This updated edition includes new chapters on Time Series Analysis and Long-Range Dependence, over 150 updated examples and cases studies, and a host of special tricks that demonstrate system superiority. Instructor's Materials, including PowerPoint slides, syllabus, and solutions for expanded exercises beyond the end-of-chapter exercises, is available making it ideal for classroom use. Performance testing measures a system's responsiveness and stability under a particular workload, and can serve to investigate, measure, validate, or verify other quality attributes of the system, including scalability, reliability, and resource usage. This book is the seminal work on the topic, providing expert guidance to systems professionals for over twenty-two years. Comprehensive coverage of all aspects of performance measurement makes it a valuable resource for students and professionals alike. Understand technique and metric criteria, and avoid common mistakes Collect, analyze, and present measurement data with the most powerful techniques Provide the maximum amount of information with the minimum number of experiments Determine the number of sizes of components required (capacity planning) Evaluate design alternatives, correctly compare two or more systems, and determine the

optimal value of a parameter (system tuning) Analysis in technology using statistics and other methodologies has become one of the most important, in-demand skills in the corporate and enterprise world. While practitioners may create new systems, they are often asked to modify, expand, or document existing systems – many of which have been grown haphazardly. Art of Computer Systems Performance Analysis provides the information, skills, and tools analysts need to tackle any system with confidence.

High Performance Browser Networking

This is a short, occasionally funny, book on how to solve and avoid application and/or computer performance problems. I wrote it to give back the knowledge, insights, tips, and tricks I was given over the last 25 years of my computing career. It shows practical ways to use key performance laws and gives well tested advice on how (and when) to do performance monitoring, capacity planning, load testing, and performance modeling. It works for any application or collection of computers because it teaches you how to decipher whatever meters they give you and how to discover more about those meters than the documentation reveals. This book covers the things that will always be true no matter what technology you are using. It will continue to be useful 20 years from now when today's technology, if it runs at all, will look as quaint as a mechanical cuckoo clock. There is no complex math required; yet it allows you to easily use some fairly advanced techniques. Simple arithmetic, and a spreadsheet program, is all that is required of you. Lastly, it helps with the human side of performance. It shows you how to get the help you need and how to present your findings (good or bad) all the way up to the CIO level.

Systems Performance

The Oracle Solaris DTrace feature revolutionizes the way you debug operating systems and applications. Using DTrace, you can dynamically instrument software and quickly answer virtually any question about its behavior. Now, for the first time, there's a comprehensive, authoritative guide to making the most of DTrace in any supported UNIX environment--from Oracle Solaris to OpenSolaris, Mac OS X, and FreeBSD. Written by key contributors to the DTrace community, DTrace teaches by example, presenting scores of commands and easy-to-adapt, downloadable D scripts. These concise examples generate answers to real and useful questions, and serve as a starting point for building more complex scripts. Using them, you can start making practical use of DTrace immediately, whether you're an administrator, developer, analyst, architect, or support professional. The authors fully explain the goals, techniques, and output associated with each script or command. Drawing on their extensive experience, they provide strategy suggestions, checklists, and functional diagrams, as well as a chapter of advanced tips and tricks. You'll learn how to Write effective scripts using DTrace's D language Use DTrace to thoroughly understand system performance Expose functional areas of the operating system, including I/O,

filesystems, and protocols Use DTrace in the application and database development process Identify and fix security problems with DTrace Analyze the operating system kernel Integrate DTrace into source code Extend DTrace with other tools This book will help you make the most of DTrace to solve problems more quickly and efficiently, and build systems that work faster and more reliably.

Optimized C++

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.

The Practice of Cloud System Administration

"If this book had been available to Healthcare.gov's contractors, and they read and followed its life cycle performance processes, there would not have been the enormous problems apparent in that application. In my 40+ years of experience in building leading-edge products, poor performance is the single most frequent cause of the failure or cancellation of

software-intensive projects. This book provides techniques and skills necessary to implement performance engineering at the beginning of a project and manage it throughout the product's life cycle. I cannot recommend it highly enough." – Don Shafer, CSDP, Technical Fellow, Athens Group, LLC Poor performance is a frequent cause of software project failure. Performance engineering can be extremely challenging. InFoundations of Software and System Performance Engineering, leading software performance expert Dr. André Bondi helps you create effective performance requirements up front, and then architect, develop, test, and deliver systems that meet them. Drawing on many years of experience at Siemens, AT&T Labs, Bell Laboratories, and two startups, Bondi offers practical guidance for every software stakeholder and development team participant. He shows you how to define and use metrics; plan for diverse workloads; evaluate scalability, capacity, and responsiveness; and test both individual components and entire systems. Throughout, Bondi helps you link performance engineering with everything else you do in the software life cycle, so you can achieve the right performance–now and in the future–at lower cost and with less pain. This guide will help you • Mitigate the business and engineering risk associated with poor system performance • Specify system performance requirements in business and engineering terms • Identify metrics for comparing performance requirements with actual performance • Verify the accuracy of measurements • Use simple mathematical models to make predictions, plan performance tests, and anticipate the impact of changes to the system or the load placed upon it • Avoid common performance and scalability mistakes • Clarify business and engineering needs to be satisfied by given levels of throughput and response time • Incorporate performance engineering into agile processes • Help stakeholders of a system make better performance-related decisions • Manage stakeholders' expectations about system performance throughout the software life cycle, and deliver a software product with quality performance André B. Bondi is a senior staff engineer at Siemens Corp., Corporate Technologies in Princeton, New Jersey. His specialties include performance requirements, performance analysis, modeling, simulation, and testing. Bondi has applied his industrial and academic experience to the solution of performance issues in many problem domains. In addition to holding a doctorate in computer science and a master's in statistics, he is a Certified Scrum Master.

Systems Performance

In today's fast and competitive world, a program's performance is just as important to customers as the features it provides. This practical guide teaches developers performance-tuning principles that enable optimization in C++. You'll learn how to make code that already embodies best practices of C++ design run faster and consume fewer resources on any computer--whether it's a watch, phone, workstation, supercomputer, or globe-spanning network of servers. Author Kurt Guntheroth provides several running examples that demonstrate how to apply these principles incrementally to improve existing code so it meets customer requirements for responsiveness and throughput. The advice in this book will prove itself the first time you hear a colleague exclaim, "Wow, that was fast. Who fixed something?"Locate performance hot spots using the profiler and software timersLearn to perform repeatable experiments to measure performance of code

changesOptimize use of dynamically allocated variablesImprove performance of hot loops and functionsSpeed up string handling functionsRecognize efficient algorithms and optimization patternsLearn the strengths--and weaknesses--of C++ container classesView searching and sorting through an optimizer's eyeMake efficient use of C++ streaming I/O functionsUse C++ thread-based concurrency features effectively

Linux Administration Handbook

Part I: An Overview of Performance Evaluation · Common Mistakes and How to Avoid Them· Selection of Techniques and Metrics· MEASUREMENT TECHNIQUES AND TOOLS· Types of Workloads· Workload Characterization Techniques· Monitors· Ratio GamesPart II: Probability Theory and Statistics · Summarizing Measured Data· Simple Linear Regression Models· Other Regression ModelsPart III: Experimental Design and Analysis · One-Factor Experiments· Two-Factor Full Factorial Design without Replications· Two-Factor Full Factorial Design with ReplicationsPart IV: Simulation· Analysis of Simulation Results· Testing Random-Number Generators· Commonly Used DistributionsPart V: Queuing Models· Analysis of a Single Queue· Operational Laws · Convolution Algorithm

Database System Implementation

How can you bring out MySQL's full power? With High Performance MySQL, you'll learn advanced techniques for everything from designing schemas, indexes, and queries to tuning your MySQL server, operating system, and hardware to their fullest potential. This guide also teaches you safe and practical ways to scale applications through replication, load balancing, high availability, and failover. Updated to reflect recent advances in MySQL and InnoDB performance, features, and tools, this third edition not only offers specific examples of how MySQL works, it also teaches you why this system works as it does, with illustrative stories and case studies that demonstrate MySQL's principles in action. With this book, you'll learn how to think in MySQL. Learn the effects of new features in MySQL 5.5, including stored procedures, partitioned databases, triggers, and views Implement improvements in replication, high availability, and clustering Achieve high performance when running MySQL in the cloud Optimize advanced querying features, such as full-text searches Take advantage of modern multi-core CPUs and solid-state disks Explore backup and recovery strategies—including new tools for hot online backups

Jenkins 2: Up and Running

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

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

Effective SEO and Content Marketing

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

Optimizing Java

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

systems based on Linux, like Android, and since Linux is so prevalent in the data center arena, including Linux-based virtualization technologies like Xen and KVM.

Java Performance: The Definitive Guide

Coding and testing are often considered separate areas of expertise. In this comprehensive guide, author and Java expert Scott Oaks takes the approach that anyone who works with Java should be equally adept at understanding how code behaves in the JVM, as well as the tunings likely to help its performance. You'll gain in-depth knowledge of Java application performance, using the Java Virtual Machine (JVM) and the Java platform, including the language and API. Developers and performance engineers alike will learn a variety of features, tools, and processes for improving the way Java 7 and 8 applications perform. Apply four principles for obtaining the best results from performance testing Use JDK tools to collect data on how a Java application is performing Understand the advantages and disadvantages of using a JIT compiler Tune JVM garbage collectors to affect programs as little as possible Use techniques to manage heap memory and JVM native memory Maximize Java threading and synchronization performance features Tackle performance issues in Java EE and Java SE APIs Improve Java-driven database application performance

Solaris Internals

Now covers Red Hat Linux! Written by Evi Nemeth, Garth Snyder, Scott Seebass, and Trent R. Hein with Adam Boggs, Rob Braun, Ned McClain, Dan Crawl, Lynda McGinley, and Todd Miller "This is not a nice, neat book for a nice, clean world. It's a nasty book for a nasty world. This is a book for the rest of us." –Eric Allman and Marshall Kirk McKusick "I am pleased to welcome Linux to the UNIX System Administration Handbook!" –Linus Torvalds, Transmeta "This book is most welcome!" –Dennis Ritchie, AT&T Bell Laboratories This new edition of the world's most comprehensive guide to UNIX system administration is an ideal tutorial for those new to administration and an invaluable reference for experienced professionals. The third edition has been expanded to include "direct from the frontlines" coverage of Red Hat Linux. UNIX System Administration Handbook describes every aspect of system administration–from basic topics to UNIX esoterica–and provides explicit coverage of four popular UNIX systems: This book stresses a practical approach to system administration. It's packed with war stories and pragmatic advice, not just theory and watered-down restatements of the manuals. Difficult subjects such as sendmail, kernel building, and DNS configuration are tackled head-on. Examples are provided for all four versions of UNIX and are drawn from real-life systems–warts and all. "This book is where I turn first when I have system administration questions. It is truly a wonderful resource and always within reach of my terminal." –W. Richard Stevens, author of numerous books on UNIX and TCP/IP "This is a comprehensive guide to the care and feeding of UNIX systems. The authors present the facts along with seasoned advice and numerous real-world examples. Their perspective on the

variations among systems is valuable for anyone who runs a heterogeneous computing facility." –Pat Parseghian, Transmeta "We noticed your book on the staff recommendations shelf at our local bookstore: 'Very clear, a masterful interpretation of the subject.' We were most impressed, until we noticed that the same staff member had also recommended Aunt Bea's Mayberry Cookbook." –Shannon Bloomstran, history teacher

High Performance MySQL

This practical book provides a step-by-step approach to testing mission-critical applications for scalability and performance before they're deployed -- a vital topic to which other books devote one chapter, if that. Businesses today live and die by network applications and web services. Because of the increasing complexity of these programs, and the pressure to deploy them quickly, many professionals don't take the time to ensure that they'll perform well and scale effectively. The Art of Application Performance Testing explains the complete life cycle of the testing process, and demonstrates best practices to help you plan, gain approval for, coordinate, and conduct performance tests on your applications. With this book, you'll learn to: Set realistic performance testing goals Implement an effective application performance testing strategy Interpret performance test results Cope with different application technologies and architectures Use automated performance testing tools Test traditional local applications, web-based applications, and web services (SOAs) Recognize and resolves issues that are often overlooked in performance tests Written by a consultant with 30 years of experience in the IT industry and over 12 years experience with performance testing, this easy-to-read book is illustrated with real-world examples and packed with practical advice. The Art of Application Performance Testing thoroughly explains the pitfalls of an inadequate testing strategy and offers you a robust, structured approach for ensuring that your applications perform well and scale effectively when the need arises. "Ian has maintained a vendor-agnostic methodology beautifully in this material. The metrics and graphs, along with background information provided in his case studies, eloquently convey to the reader, 'Methodology above all, tools at your discretion' Ian's expertise shines through throughout the entire reading experience."-- Matt St. Onge, Enterprise Solution Architect, HCL Technologies America / Teradyne

UNIX System Administration Handbook

Design, implement, and execute continuous delivery pipelines with a level of flexibility, control, and ease of maintenance that was not possible with Jenkins before. With this practical book, build administrators, developers, testers, and other professionals will learn how the features in Jenkins 2 let you define pipelines as code, leverage integration with other key technologies, and create automated, reliable pipelines to simplify and accelerate your DevOps environments. Author Brent Laster shows you how Jenkins 2 is significantly different from the more traditional, web-only versions of this popular open source automation platform. If you're familiar with Jenkins and want to take advantage of the new technologies to transform

your legacy pipelines or build new modern, automated continuous delivery environments, this is your book. Create continuous delivery pipelines as code with the Jenkins domain-specific language Get practical guidance on how to migrate existing jobs and pipelines Harness best practices and new methods for controlling access and security Explore the structure, implementation, and use of shared pipeline libraries Learn the differences between declarative syntax and scripted syntax Leverage new and existing project types in Jenkins Understand and use the new Blue Ocean graphical interface Take advantage of the capabilities of the underlying OS in your pipeline Integrate analysis tools, artifact management, and containers

Performance Modeling and Design of Computer Systems

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

The Practical Performance Analyst

"The Solaris™ Internals volumes are simply the best and most comprehensive treatment of the Solaris (and OpenSolaris) Operating Environment. Any person using Solaris--in any capacity--would be remiss not to include these two new volumes in their personal library. With advanced observability tools in Solaris (likeDTrace), you will more often find yourself in what was previously unchartable territory. Solaris™ Internals, Second Edition, provides us a fantastic means to be able to quickly understand these systems and further explore the Solaris architecture--especially when coupled with OpenSolaris source availability." --Jarod Jenson, chief systems architect, Aeysis "The Solaris™ Internals volumes by Jim Mauro and Richard McDougall must be on your bookshelf if you are interested in in-depth knowledge of Solaris operating system internals and architecture. As a senior Unix engineer for many years, I found the first edition of Solaris™ Internals the only fully comprehensive source for kernel developers, systems programmers, and systems administrators. The new second edition,

with the companion performance and debugging book, is an indispensable reference set, containing many useful and practical explanations of Solaris and its underlying subsystems, including tools and methods for observing and analyzing any system running Solaris 10 or OpenSolaris." --Marc Strahl, senior UNIX engineer Solaris™ Internals, Second Edition, describes the algorithms and data structures of all the major subsystems in the Solaris 10 and OpenSolaris kernels. The text has been extensively revised since the first edition, with more than 600 pages of new material. Integrated Solaris tools and utilities, including DTrace, MDB, kstat, and the process tools, are used throughout to illustrate how the reader can observe the Solaris kernel in action. The companion volume, Solaris™ Performance and Tools, extends the examples contained here, and expands the scope to performance and behavior analysis. Coverage includes: Virtual and physical memory Processes, threads, and scheduling File system framework and UFS implementation Networking: TCP/IP implementation Resource management facilities and zones The Solaris™ Internals volumes make a superb reference for anyone using Solaris 10 and OpenSolaris.

The Art of Application Performance Testing

Power and Performance: Software Analysis and Optimization is a guide to solving performance problems in modern Linux systems. Power-efficient chips are no help if the software those chips run on is inefficient. Starting with the necessary architectural background as a foundation, the book demonstrates the proper usage of performance analysis tools in order to pinpoint the cause of performance problems, and includes best practices for handling common performance issues those tools identify. Provides expert perspective from a key member of Intel's optimization team on how processors and memory systems influence performance Presents ideas to improve architectures running mobile, desktop, or enterprise platforms Demonstrates best practices for designing experiments and benchmarking throughout the software lifecycle Explains the importance of profiling and measurement to determine the source of performance issues

TCP/IP Illustrated, Volume 1

Get beyond the basics and see how modern-day users are reimaging the SEO process SEO is often underutilized and overlooked across the marketing realm today. SEO is not merely trying to improve your website ranking on Google, but it can spark and optimize ideas. Above all it can help improve the amount of free traffic coming to your web properties. This book provides you with a comprehensive approach to make sure marketing spend is utilized as effectively as possible and deliver the best ROI for your brand and business. Maximizing your organic (free) traffic channels should be a top priority and this book will provide you with insight on how to do that. From working with social media influencers to steering creative ideas and campaigns, modern day SEO requires a full-service perspective of marketing and its processes. General education on SEO and organic content marking Understanding which search engines to focus on How SEO and content can

solve business problems Building a new brand through SEO and content Identifying who your true competitors are Which Analytics reports you should be regularly monitoring How to establish research channels that can inform your business initiatives Building personas and audience purchase journeys Prioritizing locations, demographics and countries What needs to be in place to maximize free traffic levels to your brands assets Understanding all the key tasks and attributes for an effective content program Data-Driven Content: Detailed instruction on how to use data to inform content responses, ideas and asset types Understanding different content asset types from standard items like articles to highly advanced assets like films, podcasts, white papers and other assets Calculating ROI for SEO and Content initiatives Small business marketing via content and SEO and having the right small business mindset for success Website and content design considerations (accessibility, principles of marketing) Optimizing for the future and looking at other search venues Amazon Optimization YouTube Optimization App Store Optimization (ASO) Podcast Optimization Optimizing Blogs and other off-site content Prepping and optimizing for the newest technologies, including voice search, artificial intelligence, and content discovery vehicles How to build an optimization path and programs that drive results and manage risks In addition to learning the most effective processes to structure your SEO, you will have access to bonus materials that accompany this book which will include worksheets, checklists, creative brief examples, quizzes, and best interview questions when hiring an SEO specialist. Modern-day marketers, business owners, and brand managers, this book is for you!

Numbersense: How to Use Big Data to Your Advantage

To facilitate scalability and resilience, many organizations now run applications in cloud native environments using containers and orchestration. But how do you know if the deployment is secure? This practical book examines key underlying technologies to help developers, operators, and security professionals assess security risks and determine appropriate solutions. Author Liz Rice, VP of open source engineering at Aqua Security, looks at how the building blocks commonly used in container-based systems are constructed in Linux. You'll understand what's happening when you deploy containers and learn how to assess potential security risks that could affect your deployments. If you run container applications with kubectl or docker and use Linux command-line tools such as ps and grep, you're ready to get started. Explore attack vectors that affect container deployments Dive into the Linux constructs that underpin containers Examine measures for hardening containers Understand how misconfigurations can compromise container isolation Learn best practices for building container images Identify container images that have known software vulnerabilities Leverage secure connections between containers Use security tooling to prevent attacks on your deployment

Linux Kernel Networking

How to make simple sense of complex statistics--from the author of Numbers Rule Your World We live in a world of Big

Data--and it's getting bigger every day. Virtually every choice we make hinges on how someone generates data . . . and how someone else interprets it--whether we realize it or not. Where do you send your child for the best education? Big Data. Which airline should you choose to ensure a timely arrival? Big Data. Who will you vote for in the next election? Big Data. The problem is, the more data we have, the more difficult it is to interpret it. From world leaders to average citizens, everyone is prone to making critical decisions based on poor data interpretations. In Numbersense, expert statistician Kaiser Fung explains when you should accept the conclusions of the Big Data "experts"--and when you should say, "Wait . . . what?" He delves deeply into a wide range of topics, offering the answers to important questions, such as: How does the college ranking system really work? Can an obesity measure solve America's biggest healthcare crisis? Should you trust current unemployment data issued by the government? How do you improve your fantasy sports team? Should you worry about businesses that track your data? Don't take for granted statements made in the media, by our leaders, or even by your best friend. We're on information overload today, and there's a lot of bad information out there. Numbersense gives you the insight into how Big Data interpretation works--and how it too often doesn't work. You won't come away with the skills of a professional statistician. But you will have a keen understanding of the data traps even the best statisticians can fall into, and you'll trust the mental alarm that goes off in your head when something just doesn't seem to add up. Praise for Numbersense "Numbersense correctly puts the emphasis not on the size of big data, but on the analysis of it. Lots of fun stories, plenty of lessons learned—in short, a great way to acquire your own sense of numbers!" Thomas H. Davenport, coauthor of Competing on Analytics and President's Distinguished Professor of IT and Management, Babson College "Kaiser's accessible business book will blow your mind like no other. You'll be smarter, and you won't even realize it. Buy. It. Now." Avinash Kaushik, Digital Marketing Evangelist, Google, and author, Web Analytics 2.0 "Each story in Numbersense goes deep into what you have to think about before you trust the numbers. Kaiser Fung ably demonstrates that it takes skill and resourcefulness to make the numbers confess their meaning." John Sall, Executive Vice President, SAS Institute "Kaiser Fung breaks the bad news—a ton more data is no panacea—but then has got your back, revealing the pitfalls of analysis with stimulating stories from the front lines of business, politics, health care, government, and education. The remedy isn't an advanced degree, nor is it common sense. You need Numbersense." Eric Siegel, founder, Predictive Analytics World, and author, Predictive Analytics "I laughed my way through this superb-useful-fun book and learned and relearned a lot. Highly recommended!" Tom Peters, author of In Search of Excellence

DTrace

How prepared are you to build fast and efficient web applications? This eloquent book provides what every web developer should know about the network, from fundamental limitations that affect performance to major innovations for building even more powerful browser applications—including HTTP 2.0 and XHR improvements, Server-Sent Events (SSE), WebSocket, and WebRTC. Author Ilya Grigorik, a web performance engineer at Google, demonstrates performance

optimization best practices for TCP, UDP, and TLS protocols, and explains unique wireless and mobile network optimization requirements. You'll then dive into performance characteristics of technologies such as HTTP 2.0, client-side network scripting with XHR, real-time streaming with SSE and WebSocket, and P2P communication with WebRTC. Deliver superlative TCP, UDP, and TLS performance Speed up network performance over 3G/4G mobile networks Develop fast and energy-efficient mobile applications Address bottlenecks in HTTP 1.x and other browser protocols Plan for and deliver the best HTTP 2.0 performance Enable efficient real-time streaming in the browser Create efficient peer-to-peer videoconferencing and low-latency applications with real-time WebRTC transports

Foundations of Software and System Performance Engineering

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Implementing Service Level Objectives

"For an engineer determined to refine and secure Internet operation or to explore alternative solutions to persistent problems, the insights provided by this book will be invaluable." —Vint Cerf, Internet pioneer TCP/IP Illustrated, Volume 1, Second Edition, is a detailed and visual guide to today's TCP/IP protocol suite. Fully updated for the newest innovations, it demonstrates each protocol in action through realistic examples from modern Linux, Windows, and Mac OS environments. There's no better way to discover why TCP/IP works as it does, how it reacts to common conditions, and how to apply it in your own applications and networks. Building on the late W. Richard Stevens' classic first edition, author Kevin R. Fall adds his cutting-edge experience as a leader in TCP/IP protocol research, updating the book to fully reflect the latest protocols and best practices. He first introduces TCP/IP's core goals and architectural concepts, showing how they can robustly connect diverse networks and support multiple services running concurrently. Next, he carefully explains Internet addressing in both IPv4 and IPv6 networks. Then, he walks through TCP/IP's structure and function from the bottom up: from link layer protocols–such as Ethernet and Wi-Fi–through network, transport, and application layers. Fall thoroughly introduces ARP, DHCP, NAT, firewalls, ICMPv4/ICMPv6, broadcasting, multicasting, UDP, DNS, and much more. He offers extensive coverage of reliable transport and TCP, including connection management, timeout, retransmission, interactive data flow, and congestion control. Finally, he introduces the basics of security and cryptography, and illuminates the crucial modern protocols for protecting security and privacy, including EAP, IPsec, TLS, DNSSEC, and DKIM. Whatever your TCP/IP experience, this book will help you gain a deeper, more intuitive understanding of the entire protocol suite so you can build better applications and run more reliable, efficient networks.

Java Performance Tuning

Systems performance analysis and tuning lead to a better end-user experience and lower costs, especially for cloud computing environments that charge by the OS instance. Systems Performance, 2nd Edition covers concepts, strategy, tools, and tuning for operating systems and applications, using Linux-based operating systems as the primary example. World-renowned systems performance expert Brendan Gregg summarizes relevant operating system, hardware, and application theory to quickly get professionals up to speed even if they've never analyzed performance before, and to refresh and update advanced readers' knowledge. Gregg illuminates the latest tools and techniques, including extended BPF, showing how to get the most out of your systems in cloud, web, and large-scale enterprise environments. He covers these and other key topics: Hardware, kernel, and application internals, and how they perform Methodologies for rapid performance analysis of complex systems Optimizing CPU, memory, file system, disk, and networking usage Sophisticated profiling and tracing with perf, Ftrace, and BPF (BCC and bpftrace) Performance challenges associated with cloud computing hypervisors Benchmarking more effectively Fully updated for current Linux operating systems and environments, Systems Performance, 2nd Edition addresses issues that apply to any computer system. The book will be a go-to reference for many years to come and recommended reading at many tech companies, like its predecessor first edition.

Art of Computer Systems Performance Analysis

Get up and running with system programming concepts in Linux Key Features Acquire insight on Linux system architecture and its programming interfaces Get to grips with core concepts such as process management, signalling and pthreads Packed with industry best practices and dozens of code examples Book Description The Linux OS and its embedded and server applications are critical components of today's software infrastructure in a decentralized, networked universe. The industry's demand for proficient Linux developers is only rising with time. Hands-On System Programming with Linux gives you a solid theoretical base and practical industry-relevant descriptions, and covers the Linux system programming domain. It delves into the art and science of Linux application programming— system architecture, process memory and management, signaling, timers, pthreads, and file IO. This book goes beyond the use API X to do Y approach; it explains the concepts and theories required to understand programming interfaces and design decisions, the tradeoffs made by experienced developers when using them, and the rationale behind them. Troubleshooting tips and techniques are included in the concluding chapter. By the end of this book, you will have gained essential conceptual design knowledge and hands-on experience working with Linux system programming interfaces. What you will learn Explore the theoretical underpinnings of Linux system architecture Understand why modern OSes use virtual memory and dynamic memory APIs Get to grips with dynamic memory issues and effectively debug them Learn key concepts and powerful system APIs related to process management Effectively perform file IO and use signaling and timers Deeply understand multithreading concepts, pthreads APIs, synchronization and scheduling Who this book is for Hands-On System Programming with Linux is for Linux system engineers, programmers, or anyone who wants to go beyond using an API set to understanding the

theoretical underpinnings and concepts behind powerful Linux system programming APIs. To get the most out of this book, you should be familiar with Linux at the user-level logging in, using shell via the command line interface, the ability to use tools such as find, grep, and sort. Working knowledge of the C programming language is required. No prior experience with Linux systems programming is assumed.

Container Security

Helps readers eliminate performance problems, covering topics including bottlenecks, profiling tools, strings, algorithms, distributed systems, and servlets.

Hands-On System Programming with Linux

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.

Concurrency Control and Recovery in Database Systems

BPF and related observability tools give software professionals unprecedented visibility into software, helping them analyze operating system and application performance, troubleshoot code, and strengthen security. BPF Performance Tools: Linux System and Application Observability is the industry's most comprehensive guide to using these tools for observability. Brendan Gregg, author of the industry's definitive guide to system performance, introduces powerful new methods and tools for doing analysis that leads to more robust, reliable, and safer code. This authoritative guide: Explores a wide

spectrum of software and hardware targets Thoroughly covers open source BPF tools from the Linux Foundation iovisor project's bcc and bpftrace repositories Summarizes performance engineering and kernel internals you need to understand Provides and discusses 150+ bpftrace tools, including 80 written specifically for this book: tools you can run as-is, without programming — or customize and develop further, using diverse interfaces and the bpftrace front-end You'll learn how to use BPF (eBPF) tracing tools to analyze CPUs, memory, disks, file systems, networking, languages, applications, containers, hypervisors, security, and the Linux kernel. You'll move from basic to advanced tools and techniques, producing new metrics, stack traces, custom latency histograms, and more. It's like having a superpower: with Gregg's guidance and tools, you can analyze virtually everything that impacts system performance, so you can improve virtually any Linux operating system or application.

BPF Performance Tools

Written with computer scientists and engineers in mind, this book brings queueing theory decisively back to computer science.

Database Internals

Linux Observability with BPF

Java Performance

Performance tuning is an experimental science, but that doesn't mean engineers should resort to guesswork and folklore to get the job done. Yet that's often the case. With this practical book, intermediate to advanced Java technologists working with complex technology stacks will learn how to tune Java applications for performance using a quantitative, verifiable approach. Most resources on performance tend to discuss the theory and internals of Java virtual machines, but this book focuses on the practicalities of performance tuning by examining a wide range of aspects. There are no simple recipes, tips and tricks, or algorithms to learn. Performance tuning is a process of defining and determining desired outcomes. And it requires diligence. Learn how Java principles and technology make the best use of modern hardware and operating systems Explore several performance tests and common anti-patterns that can vex your team Understand the pitfalls of measuring Java performance numbers and the drawbacks of microbenchmarking Dive into JVM garbage collection logging, monitoring, tuning, and tools Explore JIT compilation and Java language performance techniques Learn performance aspects of the Java

Collections API and get an overview of Java concurrency

The Every Computer Performance Book

This book gives the experience of seeing the first product released into the market and becoming the product so successful we can discuss about the product very interestingly but the product success key factor is depends upon on how well the performance is handled.Some of the important things need follow for implementing the successful performance strategy which includes below conceptsPerformance Testing process and its life cycle.Complete information on LoadRunner tool.Basic guide for JMeter load testing tool.How to do Mobile performance testing using LoadRunner and JMeter tools.How to use Blazemeter cloud performance testing tool.Explanation of various application monitoring tools.Wonderful 200 important interview questions.

Power and Performance

"There's an incredible amount of depth and thinking in the practices described here, and it's impressive to see it all in one place." —Win Treese, coauthor of Designing Systems for Internet Commerce The Practice of Cloud System Administration, Volume 2, focuses on "distributed" or "cloud" computing and brings a DevOps/SRE sensibility to the practice of system administration. Unsatisfied with books that cover either design or operations in isolation, the authors created this authoritative reference centered on a comprehensive approach. Case studies and examples from Google, Etsy, Twitter, Facebook, Netflix, Amazon, and other industry giants are explained in practical ways that are useful to all enterprises. The new companion to the best-selling first volume, The Practice of System and Network Administration, Second Edition, this guide offers expert coverage of the following and many other crucial topics: Designing and building modern web and distributed systems Fundamentals of large system design Understand the new software engineering implications of cloud administration Make systems that are resilient to failure and grow and scale dynamically Implement DevOps principles and cultural changes IaaS/PaaS/SaaS and virtual platform selection Operating and running systems using the latest DevOps/SRE strategies Upgrade production systems with zero down-time What and how to automate; how to decide what not to automate On-call best practices that improve uptime Why distributed systems require fundamentally different system administration techniques Identify and resolve resiliency problems before they surprise you Assessing and evaluating your team's operational effectiveness Manage the scientific process of continuous improvement A forty-page, pain-free assessment system you can start using today

Linux System Programming

"As this book shows, Linux systems are just as functional, secure, and reliable as their proprietary counterparts. Thanks to the ongoing efforts of thousands of Linux developers, Linux is more ready than ever for deployment at the frontlines of the real world. The authors of this book know that terrain well, and I am happy to leave you in their most capable hands." –Linus Torvalds "The most successful sysadmin book of all time–because it works!" –Rik Farrow, editor of ;login: "This book clearly explains current technology with the perspective of decades of experience in large-scale system administration. Unique and highly recommended." –Jonathan Corbet, cofounder, LWN.net "Nemeth et al. is the overall winner for Linux administration: it's intelligent, full of insights, and looks at the implementation of concepts." –Peter Salus, editorial director, Matrix.net Since 2001, Linux Administration Handbook has been the definitive resource for every Linux® system administrator who must efficiently solve technical problems and maximize the reliability and performance of a production environment. Now, the authors have systematically updated this classic guide to address today's most important Linux distributions and most powerful new administrative tools. The authors spell out detailed best practices for every facet of system administration, including storage management, network design and administration, web hosting, software configuration management, performance analysis, Windows interoperability, and much more. Sysadmins will especially appreciate the thorough and up-to-date discussions of such difficult topics such as DNS, LDAP, security, and the management of IT service organizations. Linux® Administration Handbook, Second Edition, reflects the current versions of these leading distributions: Red Hat® Enterprise Linux® FedoraTM Core SUSE® Linux Enterprise Debian® GNU/Linux Ubuntu® Linux Sharing their war stories and hard-won insights, the authors capture the behavior of Linux systems in the real world, not just in ideal environments. They explain complex tasks in detail and illustrate these tasks with examples drawn from their extensive hands-on experience.

The Art Of Computer Systems Performance Analysis: Techniques For Experimental Measurement, Simulation, And Modeling

"Large-scale enterprise, cloud, and virtualized computing systems have introduced serious performance challenges. Now, internationally renowned performance expert Brendan Gregg has brought together proven methodologies, tools, and metrics for analyzing and tuning even the most complex environments. Systems Performance: Enterprise and the Cloud focuses on Linux® and Unix® performance, while illuminating performance issues that are relevant to all operating systems. You'll gain deep insight into how systems work and perform, and learn methodologies for analyzing and improving system and application performance. Gregg presents examples from bare-metal systems and virtualized cloud tenants running Linux-based Ubuntu®, Fedora®, CentOS, and the illumos-based Joyent® SmartOSTM and OmniTI OmniOS®. He systematically covers modern systems performance, including the "traditional" analysis of CPUs, memory, disks, and networks, and new areas including cloud computing and dynamic tracing. This book also helps you identify and fix the "unknown unknowns" of complex performance: bottlenecks that emerge from elements and interactions you were not

aware of. The text concludes with a detailed case study, showing how a real cloud customer issue was analyzed from start to finish."--Back cover.

Optimizing Oracle Performance

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.

Excellence in Performance Testing and Engineering Handy Book

The ONLY complete, up-to-date guide to all aspects of Java performance • •The first one-stop guide to identifying, isolating, and fixing Java performance issues on multicore and multiprocessor processor platforms - from two of Sun's leading Java performance experts. •Includes crucial new insights into microbenchmarking found nowhere else. •Contains up-to-the-minute coverage of Java optimization, including migration of older applications. Given Java's ubiquity and indispensability, Java software performance is of crucial importance to millions of developers worldwide. The emergence of multi-core systems and the evolution of the Java platform give developers many new opportunities to optimize performance. Now, three of Sun's leading Java performance experts have written the first start-to-finish guide to optimizing Java performance in today's multi-core systems. Java Performance gives developers, designers, and architects all the information they need to leverage Java's performance and scalability abilities on any modern multicore or multiprocessor system. This book's end-to-end coverage addresses all these topics: monitoring and profiling; the effective use of garbage collection and other language features; adaptive and platform-specific tuning; techniques for maximizing scalability; and much more. The authors' extensive benchmarking coverage includes an indispensable introduction to effective microbenchmarks - including guidance on avoiding the common microbenchmarking mistakes that mislead developers into writing badlyperforming software. The book also contains a complete section on Java performance enhancement, including opportunities and challenges associated with migrating software from Java 1.4.2 and Java 5 - issues that more and more Java developers are now facing.

ROMANCE ACTION & ADVENTURE MYSTERY & THRILLER BIOGRAPHIES & HISTORY CHILDREN'S YOUNG ADULT FANTASY HISTORICAL FICTION HORROR LITERARY FICTION NON-FICTION SCIENCE FICTION