

# Linux Networking Architecture

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<i>Linux Networking Architecture</i>	<i>2021-09-19</i>
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*Linux Networking Cookbook* Wiley

Cluster computers provide a low-cost alternative to multiprocessor systems for many applications. Building a cluster computer is within the reach of any computer user with solid C programming skills and a knowledge of operating systems, hardware, and networking. This book leads you through the design and assembly of such a system, and shows you how to measure and tune its overall performance. A cluster computer is a multicomputer, a network of node computers running distributed software that makes them work together as a team. Distributed software turns a collection of networked computers into a distributed system. It presents the user with a single-system image and gives the system its personality. Software can turn a network of computers into a transaction processor, a supercomputer, or even a novel design of your own. Some of the techniques used in this book's distributed algorithms might be new to many readers, so several of the chapters are dedicated to such topics. You will learn about the hardware needed to network several PCs, the operating system files that need to be changed to support that network, and the multitasking and the interprocess communications skills needed to put the network to good use. Finally, there is a simple distributed transaction processing application in the book. Readers can experiment with it, customize it, or use it as a basis for something completely different.

**Understanding Linux Network Internals** "O'Reilly Media, Inc."

The authors meet the growing demands of de-centralized companies that need a secure and functional network using Linux. The only book available that extensively covers the combination of VPN technology and Linux, this volume teaches first hand how to build various VPN solutions with individual setup guides.

**Linux Network Administrator's Guide** John Wiley & Sons

This introduction to networking on Linux now covers firewalls, including the use of ipchains and Netfilter, masquerading, and accounting. Other new topics in this second edition include Novell (NCP/IPX) support and INN (news administration).

**Linux System Programming** No Starch Press

Mathematical techniques pervade current research in computer networking, yet are not taught to most computer science undergraduates. This self-contained, highly-accessible book bridges the gap, providing the mathematical grounding students and professionals need to successfully design or evaluate networking systems. The only book of its kind, it brings together information previously scattered amongst multiple texts. It first provides crucial background in basic mathematical tools, and then illuminates the specific theories that underlie computer networking. Coverage includes: \* Basic probability \* Statistics \* Linear Algebra \* Optimization \* Signals, Systems, and Transforms, including Fourier series and transforms, Laplace transforms, DFT, FFT, and Z transforms \* Queuing theory \* Game Theory \* Control theory \* Information theory

*Hands-On Linux for Architects* Wiley-IEEE Computer Society Press

This book provides thorough knowledge of Linux TCP/IP stack and kernel framework for its network stack, including complete knowledge of design and implementation. Starting with simple client-server socket programs and progressing to complex design and implementation of TCP/IP protocol in linux, this book provides different aspects of socket programming and major TCP/IP related algorithms. In addition, the text features netfilter hook framework, a complete explanation of routing sub-system, IP QOS implementation, and Network Soft IRQ. This book further contains elements on TCP state machine implementation, TCP timer implementation on Linux, TCP memory management on Linux, and debugging TCP/IP stack using lcrash

**Advanced Networking Concepts Applied Using Linux on IBM System z** Apress

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

**Building Embedded Linux Systems** "O'Reilly Media, Inc."

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.

**The Linux Networking Architecture** IBM Redbooks

Architecture of Network Systems explains the practice and methodologies that will allow you to solve a broad range of problems in system design, including problems related to security, quality of service, performance, manageability, and more. Leading researchers Dimitrios Serpanos and Tilman Wolf develop architectures for all network sub-systems, bridging the gap between operation and VLSI. This book provides comprehensive coverage of the technical aspects of network systems, including system-on-chip technologies, embedded protocol processing and high-performance, and low-power design. It develops a functional approach to network system architecture based on the OSI reference model, which is useful for practitioners at

every level. It also covers both fundamentals and the latest developments in network systems architecture, including network-on-chip, network processors, algorithms for lookup and classification, and network systems for the next-generation Internet. The book is recommended for practicing engineers designing the architecture of network systems and graduate students in computer engineering and computer science studying network system design. This is the first book to provide comprehensive coverage of the technical aspects of network systems, including processing systems, hardware technologies, memory managers, software routers, and more. Develops a systematic approach to network architectures, based on the OSI reference model, that is useful for practitioners at every level. Covers both the important basics and cutting-edge topics in network systems architecture, including Quality of Service and Security for mobile, real-time P2P services, Low-Power Requirements for Mobile Systems, and next generation Internet systems.

*The Linux Networking Architecture* John Wiley & Sons

This soup-to-nuts collection of recipes covers everything you need to know to perform your job as a Linux network administrator, whether you're new to the job or have years of experience. With Linux Networking Cookbook, you'll dive straight into the gnarly hands-on work of building and maintaining a computer network. Running a network doesn't mean you have all the answers. Networking is a complex subject with reams of reference material that's difficult to keep straight, much less remember. If you want a book that lays out the steps for specific tasks, that clearly explains the commands and configurations, and does not tax your patience with endless ramblings and meanderings into theory and obscure RFCs, this is the book for you. You will find recipes for: Building a gateway, firewall, and wireless access point on a Linux network Building a VoIP server with Asterisk Secure remote administration with SSH Building secure VPNs with OpenVPN, and a Linux PPTP VPN server Single sign-on with Samba for mixed Linux/Windows LANs Centralized network directory with OpenLDAP Network monitoring with Nagios or MRTG Getting acquainted with IPv6 Setting up hands-free networks installations of new systems Linux system administration via serial console And a lot more. Each recipe includes a clear, hands-on solution with tested code, plus a discussion on why it works. When you need to solve a network problem without delay, and don't have the time or patience to comb through reference books or the Web for answers, Linux Networking Cookbook gives you exactly what you need.

**Linux TCP/IP Network Administration** Pearson Education

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.

*Securing & Optimizing Linux* "O'Reilly Media, Inc."

Explore practical use cases to learn everything from Linux components, and functionalities, through to hardware and software support Key FeaturesGain a clear understanding of how to design a Linux environmentLearn more about the architecture of the modern Linux operating system(OS)Understand infrastructure needs and design a high-performing computing environmentBook Description It is very important to understand the flexibility of an infrastructure when designing an efficient environment. In this book, you will cover everything from Linux components and functionalities through to hardware and software support, which will help you to implement and tune effective Linux-based solutions. This book gets started with an overview of Linux design methodology. Next, you will focus on the core concepts of designing a solution. As you progress, you will gain insights into the kinds of decisions you need to make when deploying a high-performance solution using Gluster File System (GlusterFS). In the next set of chapters, the book will guide you through the technique of using Kubernetes as an orchestrator for deploying and managing containerized applications. In addition to this, you will learn how to apply and configure Kubernetes for your NGINX application. You'll then learn how to implement an ELK stack, which is composed of Elasticsearch, Logstash, and Kibana. In the concluding chapters, you will focus on installing and configuring a Saltstack solution to manage different Linux distributions, and explore a variety of design best practices. By the end of this book, you will be well-versed with designing a high-performing computing environment for complex applications to run on. By the end of the book, you will have delved inside the most detailed technical conditions of designing a solution, and you will have also dissected every aspect in detail in order to implement and tune open source Linux-based solutions What you will learnStudy the basics of infrastructure design and the steps involvedExpand your current design portfolio with Linux-based solutionsDiscover open source software-based solutions to optimize your architectureUnderstand the role of high availability and fault tolerance in a resilient designIdentify the role of containers and how they improve your continuous integration and continuous deployment pipelinesGain insights into optimizing and making resilient and highly available designs by applying industry best practicesWho this book is for This intermediate-level book is for Linux system administrators, Linux support engineers, DevOps engineers, Linux consultants or any open source technology professional looking to learn or expand their knowledge in architecting, designing and implementing solutions based on Linux and open source software. Prior experience in Linux is required.

**TCP/IP Architecture, Design and Implementation in Linux** "O'Reilly Media, Inc."

Master the skills and techniques that are required to design, deploy, and administer real Linux-based networks About This Book Master the art of using Linux and administering network services for enterprise environments Perform hands-on activities to reinforce expert-level knowledge Get full coverage of both the CentOS and Debian systems, including how networking concepts differ for each Who This Book Is For Mastering Linux Network Administration is recommended for those who already understand the basics of using Linux and networking, and would like to push those skills to a higher level through real-world Linux networking scenarios. Whether you intend to run a home office consisting of Linux nodes or a rollout of a Linux

network within your organization, this book is a great fit for those that desire to learn how to manage networked systems with the power of Linux. What You Will Learn Install and configure the Debian and CentOS systems Set up and configure file servers Administer networked nodes remotely Discover how to monitor system performance for peak health Configure network services such as DNS and DHCP Host HTTP content via Apache Troubleshoot Linux networking issues In Detail Linux is everywhere. Whether you run a home office, a small business, or manage enterprise systems, Linux can empower your network to perform at its very best. Armed with the advanced tools and best practice guidance of this practical guide, you'll be able to mold Linux networks to your will, empowering your systems and their users to take advantage of all that Linux-based networks have to offer. Understand how Linux networks function and get to grips with essential tips and tricks to manage them - whether you're already managing a networks, or even just starting out. With Debian and CentOS as its source, this book will divulge all the details you need to manage a real Linux-based network. With detailed activities and instructions based on real-world scenarios, this book will be your guide to the exciting world of Linux networking. Style and approach This practical guide will walk you through all the core concepts required to manage real Linux-based networks.

#### **The SuSE Linux Network** Sams Publishing

A SuSE Press title -- this book enlightens you on how to build a strong, reliable network for next to nothing-using SuSE Linux. The SuSE Linux Network is packed with insider tips and techniques from the networking gurus and SuSE, Inc., the Linux experts. The SuSE Linux Network is the first of a grouping of SuSE Press books to deal with high-end topics that present challenges for Linux administrators, power users and programmers. Master the ins and outs of networking-hardware, software, and protocols for SuSE Linux, and keep your network safe, sound and reliable with SuSE Linux and the guidance in this book.

#### **Mastering Linux Network Administration** Packt Publishing Ltd

Linux® is being adopted by an increasing number of embedded systems developers, who have been won over by its sophisticated scheduling and networking, its cost-free license, its open development model, and the support offered by rich and powerful programming tools. While there is a great deal of hype surrounding the use of Linux in embedded systems, there is not a lot of practical information. Building Embedded Linux Systems is the first in-depth, hard-core guide to putting together an embedded system based on the Linux kernel. This indispensable book features arcane and previously undocumented procedures for: Building your own GNU development toolchain Using an efficient embedded development framework Selecting, configuring, building, and installing a target-specific kernel Creating a complete target root filesystem Setting up, manipulating, and using solid-state storage devices Installing and configuring a bootloader for the target Cross-compiling a slew of utilities and packages Debugging your embedded system using a plethora of tools and techniques Details are provided for various target architectures and hardware configurations, including a thorough review of Linux's support for embedded hardware. All explanations rely on the use of open source and free software packages. By presenting how to build the operating system components from pristine sources and how to find more documentation or help, this book greatly simplifies the task of keeping complete control over one's embedded operating system, whether it be for technical or sound financial reasons. Author Karim Yaghmour, a well-known designer and speaker who is responsible for the Linux Trace Toolkit, starts by discussing the strengths and weaknesses of Linux as an embedded operating system. Licensing issues are included, followed by a discussion of the basics of building embedded Linux systems. The configuration, setup, and use of over forty different open source and free software packages commonly used in embedded Linux systems are also covered. uClibc, BusyBox, U-Boot, OpenSSH, tftpd, tftp, strace, and gdb are among the packages discussed.

#### **Advanced Linux Networking** Apress

"Advanced Linux Networking" is designed to help users achieve a higher level of competence. It focuses on powerful techniques and features of Linux networking and provides the know-how needed to improve server efficiency, enhance security, and adapt to new requirements.

#### **Professional Linux Kernel Architecture** "O'Reilly Media, Inc."

While there are books that tell readers how to run Linux on embedded hardware and books on how to build a Linux application, this volume is the first book to demonstrate how to merge the two to create a Linux appliance.

#### **Building Linux Virtual Private Networks (VPNs)** "O'Reilly Media, Inc."

Using a horizontal format, which allows for exhaustive cross-referencing, this title features over 500,000 lines of code listed and numbered

sequentially and corresponding to the commentary in the second part of the book. The CD-ROM features the code plus software that allows users to search for specific features.

#### **TCP/IP and Linux Protocol Implementation** Packt Publishing Ltd

This book provides thorough knowledge of Linux TCP/IP stack and kernel framework for its network stack, including complete knowledge of design and implementation. Starting with simple client-server socket programs and progressing to complex design and implementation of TCP/IP protocol in linux, this book provides different aspects of socket programming and major TCP/IP related algorithms. In addition, the text features netfilter hook framework, a complete explanation of routing sub-system, IP QOS implementation, and Network Soft IRQ. This book further contains elements on TCP state machine implementation, TCP timer implementation on Linux, TCP memory management on Linux, and debugging TCP/IP stack using lcrash

#### **Linux Appliance Design** "O'Reilly Media, Inc."

This IBM® Redbooks® publication describes important networking concepts and industry standards that are used to support high availability on IBM System z®. Some of the networking standards described here are VLANs, VLAN trunking, link aggregation, virtual switches, VNICs, and load-balancing. We examine the various aspects of network setups and introduce the main Linux on System z networking commands and configuration files. We describe the management of network interface parameters, assignment of addresses to a network interface, and usage of the ifconfig command to configure network interfaces. We provide an overview of connectivity options available on the System z platform. We also describe high availability concepts and building a high availability solution using IBM Tivoli® System Automation. We also provide the implementation steps necessary to build a redundant network connections set up between an IBM z/VM® system and the external network switches using two Open Systems Adapter-Express 3 (OSA-Express 3) adapters with 10 Gb Ethernet ports. We describe the tests performed in our lab environment. The objectives of these tests were to gather information about performance and failover from the perspective of a real scenario, where the concepts of described in this book were applied. This book is focused on information that is practical and useful for readers with experience in network analysis and engineering networks, System z and Linux systems administrators, especially for readers that administer networks in their day-to-day activities. For additional reading: A Technote is available that explains changes to using channel bonding interfaces introduced with SLES 11 SP 2. It can be found at: <http://www.redbooks.ibm.com/abstracts/tips1000.html?Open>

#### **Understanding Linux Network Internals** "O'Reilly Media, Inc."

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.