

# TCP/IP Illustrated, Volume 1

The Protocols

W. Richard Stevens



ADDISON-WESLEY PROFESSIONAL COMPUTING SERIES

# **TCP/IP Illustrated, Volume 1**

---

## **The Protocols**

**W. Richard Stevens**



**ADDISON-WESLEY PUBLISHING COMPANY**

Reading, Massachusetts Menlo Park, California New York

Don Mills, Ontario Wokingham, England Amsterdam

Bonn Sydney Singapore Tokyo Madrid San Juan

Seoul Milan Mexico City Taipei

UNIX is a technology trademark of X/Open Company, Ltd.

The publisher offers discounts on this book when ordered in quantity for special sales.

For more information please contact:

Corporate & Professional Publishing Group  
Addison-Wesley Publishing Company  
One Jacob Way  
Reading, Massachusetts 01867

Library of Congress Cataloging-in-Publication Data

Stevens, W. Richard

TCP/IP Illustrated: the protocols/W. Richard Stevens.

p. cm. — (Addison-Wesley professional computing series)

Includes bibliographical references and index.

ISBN 0-201-63346-9 (v. 1)

1. TCP/IP (Computer network protocol) I. Title. II. Series.

TK5105.55S74 1994

004.6'2—dc20

Copyright © 1994 by Addison-Wesley Publishing Company, Inc.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form, or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written consent of the publisher. Printed in the United States of America. Published simultaneously in Canada.

Text printed on recycled and acid-free paper

ISBN 0-201-63346-9

7 8 9 10 11 12 13 14 15-MA-99989796

Seventh printing, March 1996

## **TCP/IP Illustrated, Volume 1**

---

## **Addison-Wesley Professional Computing Series**

---

Brian W. Kernighan, Consulting Editor

Ken Arnold/John Peyton, *A C User's Guide to ANSI C*

Tom Cargill, *C++ Programming Style*

William R. Cheswick/Steven M. Bellovin, *Firewalls and Internet Security: Repelling the Wily Hacker*

David A. Curry, *UNIX® System Security: A Guide for Users and System Administrators*

Erich Gamma/Richard Helm/Ralph Johnson/John Vlissides, *Design Patterns: Elements of Reusable Object-Oriented Software*

John Lakos, *Large-Scale C++ Software Design*

Scott Meyers, *Effective C++: 50 Specific Ways to Improve Your Programs and Designs*

Scott Meyers, *More Effective C++: 35 New Ways to Improve Your Programs and Designs*

Robert B. Murray, *C++ Strategies and Tactics*

David R. Musser/Atul Saini, *STL Tutorial and Reference Guide: C++ Programming with the Standard Template Library*

John K. Ousterhout, *Tcl and the Tk Toolkit*

Craig Partridge, *Gigabit Networking*

J. Stephen Pendergrast Jr., *Desktop KornShell Graphical Programming*

Radia Perlman, *Interconnections: Bridges and Routers*

David M. Piscitello/A. Lyman Chapin, *Open Systems Networking: TCP/IP and OSI*

Stephen A. Rago, *UNIX® System V Network Programming*

Curt Schimmel, *UNIX® Systems for Modern Architectures: Symmetric Multiprocessing and Caching for Kernel Programmers*

W. Richard Stevens, *Advanced Programming in the UNIX® Environment*

W. Richard Stevens, *TCP/IP Illustrated, Volume 1: The Protocols*

W. Richard Stevens, *TCP/IP Illustrated, Volume 3: TCP for Transactions, HTTP, NNTP, and the UNIX Domain Protocols*

Gary R. Wright/W. Richard Stevens, *TCP/IP Illustrated, Volume 2: The Implementation*

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.