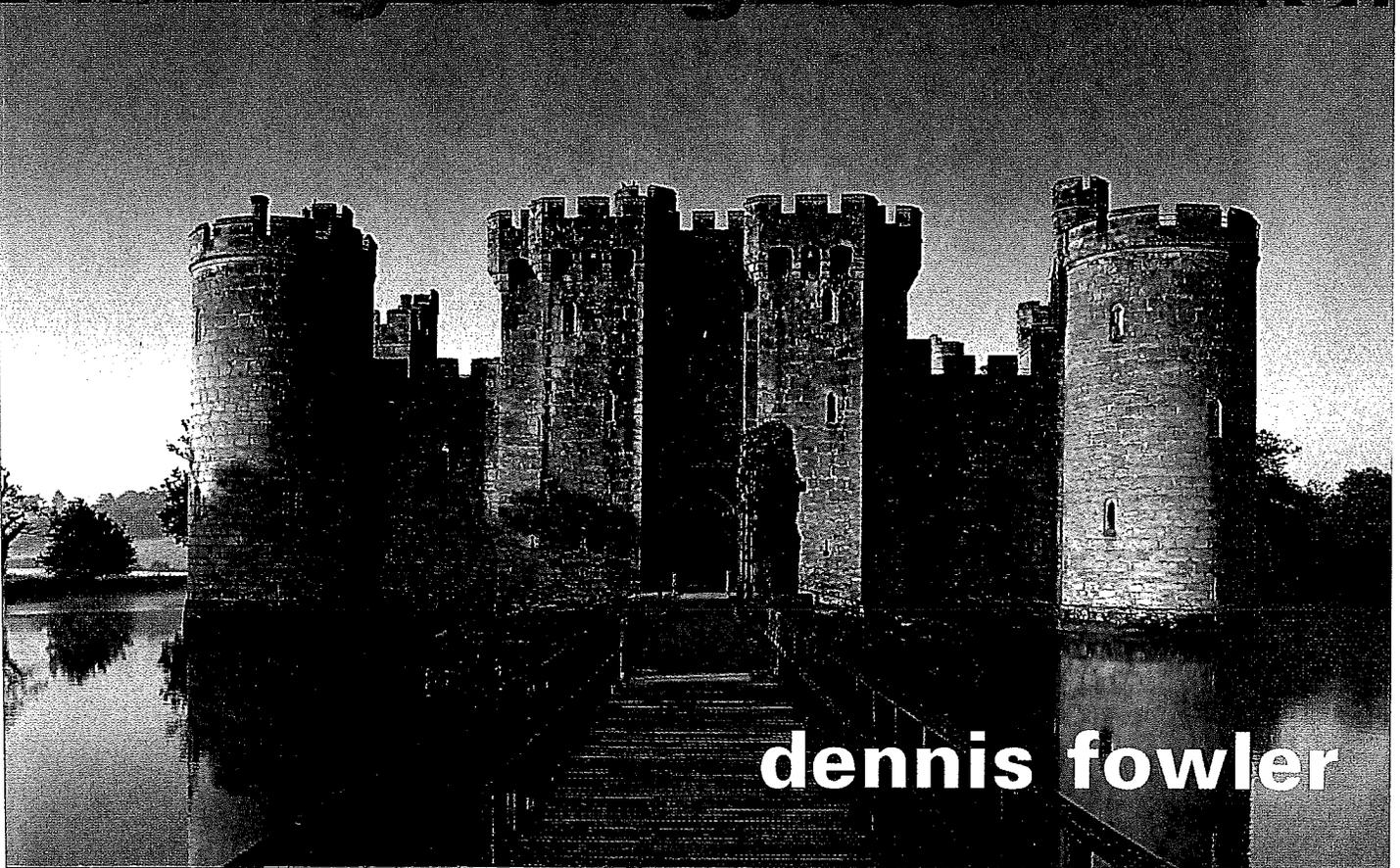


virtual private networks

making the right connection



dennis fowler

Virtual Private Networks

Making the Right Connection

Dennis Fowler

netWorker Magazine,
Association for Computing Machinery



MORGAN KAUFMANN PUBLISHERS, INC.
San Francisco, California

Senior Editor
Director of Production and Manufacturing
Production Editor
Editorial Assistant
Cover Design
Cover Image
Text Design
Copyeditor
Proofreader
Composition and Illustration
Indexer
Printer

Jennifer Mann
Yonie Overton
Cheri Palmer
Karyn Johnson
Ross Carron Design
© Patrick Ingrand/Tony Stone Images
Side by Side Studios
Jeff Van Bueren
Jennifer McClain
Technologies 'n Typography
Ty Koontz
Courier Corporation

Designations used by companies to distinguish their products are often claimed as trademarks or registered trademarks. In all instances where Morgan Kaufmann Publishers, Inc. is aware of a claim, the product names appear in initial capital or all capital letters. Readers, however, should contact the appropriate companies for more complete information regarding trademarks and registration.

Morgan Kaufmann Publishers, Inc.
Editorial and Sales Office
340 Pine Street, Sixth Floor
San Francisco, CA 94104-3205
USA

Telephone 415 / 392-2665
Facsimile 415 / 982-2665
Email mkp@mkp.com
WWW <http://www.mkp.com>
Order toll free 800 / 745-7323

© 1999 by Morgan Kaufmann Publishers, Inc.
All rights reserved
Printed in the United States of America

03 02 01 00 99 5 4 3 2 1

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 permission of the publisher.

Library of Congress Cataloging-in-Publication Data

Fowler, Dennis.

Virtual private networks : making the right connection / Dennis

Fowler.

p. cm.

Includes bibliographical references.

ISBN 1-55860-575-4

1. Extranets (Computer networks) 2. Business enterprises—computer networks.

3. Internet (Computer network) 4. Computer networks—Security measures. I. Title.

TK5105.875.E87F69 1999

650'.0285'46—DC21

99-13845

CIP

Preface

Almost lost in the glare and thunder of the Web is the fact that, at its heart, the Internet is a communications medium. Like the telephone network, it can serve many functions. Several years ago a few pioneering businesses and organizations discovered that, by using the public infrastructure of the Internet and its ilk, they could tie offices and facilities together in a new, exciting, cost-effective way, no matter where they were located, by building virtual private networks (VPNs). VPNs use robust, redundant public networks such as the Internet, instead of expensive and vulnerable leased lines, for their wide area networks and extranets. These businesses also discovered that, by letting their road warriors log on to the home network through the Internet, they could be freed from the expensive tyranny of long-distance dial-up telephone networks for remote access to the home network.

This interest caught the attention of Internet and networking service providers and of major networking hardware and software developers and vendors, all of whom are now feeding this burgeoning market. These include communications giants such as AT&T, MCI, and Sprint; networking hardware stalwarts such as Cisco and 3Com; software players such as Microsoft, Check Point, and Novell, and hundreds of others.

As VPN technologies have developed, so, too, has massive confusion—confusion as to just what a VPN is, what it can do for you, and how to implement one.

This book is intended to clear away the confusion. It explains what VPNs are, what they can do for you, and how they work, and it lays out the choices you have in planning and implementing your own virtual private network. The book also tells you what to expect once you have a VPN up and running. It covers both the positive side of VPNs and the pitfalls to avoid as you consider this technology.

Audience

The book is aimed at executives, managers, and upper-level technicians who are unfamiliar with VPNs and the technologies that make them possible. If you are a manager looking for a way to connect your office network in New York with the factory in Potstown, or you are trying to cut the phone bills of your reps around the country, this is the book for you. It shows you how you can give your mobile sales force direct access to the home office network so they have the latest product information. It explains how the Internet can be used to tie together the local area networks in your satellite facilities into one super network so that the entire workforce can be brought to bear on an opportunity or problem.

A Road Map

To simplify your reading, the book is divided into three sections. If you are a manager or an executive unfamiliar with VPNs, you should begin at the beginning. The first three chapters will show you just exactly what a VPN is and, drawing on real-life examples of VPNs in use today, what it can do for you. To keep you from getting too rosy a view of the situation, however, you will also see that VPNs have their risks, just as they have their rewards. We attempt to give you a balanced perspective so that you can make a reasonable decision as to whether a VPN is really what you want to get involved with.

Chapter 4 is a bridging chapter, of interest to executives and managers as well as to the more technically oriented. It discusses the choices of networks you have for implementing your VPN. While it does carry information for the technically inclined, this information is also important for managers as well, to help them understand that the Internet is not necessarily the best choice for a VPN substrate, that there are other options that it is important to explore, what those options are, how they work in comparison to the Internet, and the advantages and disadvantages of the available infrastructures.

The middle section of the book, beginning with Chapter 5, is more technically oriented and is aimed more at the technician; it discusses the various elements that go into a VPN. One of the crucial problems is keeping your private data private as it traverses the public networks, and this is where encryption comes into the VPN picture. In Chapter 5, you'll get a thorough grounding in what encryption is, what the various types of encryption are, and how they are combined and implemented to protect your data. Chapter 6 continues this theme by discussing the problems that encryption itself raises: authenticating users for access to data, verifying the integrity of the data after it

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.