

Graw-Hill Technical Expert



Cisco Packetized Voice & Data *Integration*

- PLANNING, DESIGNING, AND DEPLOYING CISCO-BASED VOICE AND DATA NETWORKS
- DELIVERING QUALITY OF SERVICE FOR BOTH IP AND FRAME RELAY
- DETAILED CASE STUDIES AND CONFIGURATION ANALYSES
- QUICK REFERENCE SECTION OF CISCO IOS COMMANDS

ROBERT CAPUTO -CCIE #1332



McGRAW-HILL TECHNICAL EXPERT SERIES

- Albritton *Cisco IOS Essentials* 0-07-134743-7
Burton *Remote Access for Cisco® Networks* 0-07-135200-7
Fischer *Configuring Cisco Routers for ISDN* 0-07-022073-5
Held and Hundley *Cisco Security Architectures* 0-07-134708-9
Lewis *Cisco Switched Internetworks: VLANs, ATM, and Voice/Data
Integration* 0-07-134646-5
Lewis *Cisco TCP/IP Routing Professional Reference, 2/e* 0-07-041130-1
Long *Cisco® Internetworking and Troubleshooting* 0-07-135598-7
Nam-Kee *Configuring Cisco® Routers for Bridging DLSW and
Desktop Protocols* 0-07-135457-3
Parkhurst *Cisco Multicast Routing and Switching* 0-07134647-3
Parkhurst *Cisco Router OSPF* 0-07-048626-3
Rossi *Cisco and IP Addressing* 0-07-134925-1
Rossi et al. *Cisco Catalyst LAN Switching* 0-07-134982-0
Sackett *Cisco Router Handbook* 0-07-058098-7
Slattery and Burton *Advanced IP Routing with Cisco Networks*
0-07-058144-4
Van Meter *Cisco and Fore ATM Internetworking* 0-07-134842-5

To order or receive additional information on these or any other McGraw-Hill titles, in the United States please call 1-800-722-4726, or visit us at www.computing.mcgraw-hill.com. In other countries, contact your McGraw-Hill representative.

0-7
073-5
34708-9
Voice/Data
0-07-041130-1
7-135598-7
W and
7134647-3
2-0
Networks
134842-5

Cisco® Packetized Voice and Data Integration

Robert Caputo

CCIE™ #13312



McGraw-Hill

New York San Francisco Washington, D.C.
Auckland Bogotá Caracas Lisbon London
Madrid Mexico City Milan Montreal New Delhi
San Juan Singapore Sydney Tokyo Toronto

4726, or



Copyright © 2000 by The McGraw-Hill Companies, Inc. All rights reserved. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a data base or retrieval system, without the prior written permission of the publisher.

1 2 3 4 5 6 7 8 9 0 AGM/AGM 9 0 4 3 2 1 0 9
0-07-134777-1

The sponsoring editor for this book was Steven Elliot, the managing editor was Jennifer Perillo, the editing supervisor was Ruth W. Mannino, and the production supervisor was Claire Stanley. It was set in New Century Schoolbook by Victoria Khavkina of McGraw-Hill's desktop composition unit in cooperation with Spring Point Publishing Services.

Printed and bound by Quebecor/Martinsburg.

This study guide and/or material is not sponsored by, endorsed by or affiliated with Cisco Systems, Inc. Cisco®, Cisco Systems®, CCDA™, CCNA™, CCDPT™, CCNP™, CCIE™, CCSI™, the Cisco Systems logo and the CCIE logo are trademarks or registered trademarks of Cisco Systems, Inc. in the United States and certain other countries. All other trademarks are trademarks of their respective owners.

Throughout this book, trademarked names are used. Rather than put a trademark symbol after every occurrence of a trademarked name, we use names in an editorial fashion only, and to the benefit of the trademark owner, with no intention of infringement of the trademark. Where such designations appear in this book, they have been printed with initial caps.

Information contained in this work has been obtained by The McGraw-Hill Companies, Inc. ("McGraw-Hill") from sources believed to be reliable. However, neither McGraw-Hill nor its authors guarantee the accuracy or completeness of any information published herein and neither McGraw-Hill nor its authors shall be responsible for any errors, omissions, or damages arising out of use of this information. This work is published with the understanding that McGraw-Hill and its authors are supplying information but are not attempting to render engineering or other professional services. If such services are required, the assistance of an appropriate professional should be sought.



This book is printed on recycled, acid-free paper containing a minimum of 50% recycled de-inked fiber.

Contents at a Glance

| | | |
|-------------------|--|-----|
| Chapter 1 | Introduction | 1 |
| Chapter 2 | Packetized Voice Overview | 7 |
| Chapter 3 | Voice Concepts for Data Engineers | 31 |
| Chapter 4 | Quality of Service for IP Traffic | 63 |
| Chapter 5 | Quality of Service for Frame Relay | 111 |
| Chapter 6 | Understanding Voice Ports and Dial Peers | 145 |
| Chapter 7 | Developing a Dial Plan | 183 |
| Chapter 8 | Integrating It All | 219 |
| Chapter 9 | Sample Configurations | 261 |
| Chapter 10 | VoIP Case Study | 305 |
| | Appendix | 319 |
| | Index | 327 |

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.