Networking Fundamentals

Richard M. Roberts

Publisher
The Goodheart-Willcox Company, Inc.
Tinley Park, Illinois
www.g-w.com

Manufactured in the United States of America.

Library of Congress Catalog Card Number 2004060667

ISBN-13: 978-1-59070-449-3
ISBN-10: 1-59070-449-5

1 2 3 4 5 6 7 8 9 – 05 – 09 08 07 06

Library of Congress Cataloging-in-Publication Data

Roberts, Richard M.
Networking fundamentals / Richard M. Roberts.
p. cm.
Includes index.
ISBN 1-59070-449-5
1. Computer networks. I. Title.

TK5105.5.R625 2005
004.6--dc22 2004060667

Introduction

The ***Networking Fundamentals*** textbook is beneficial to anyone wishing to pursue a career in information technology. It provides the skills and basic knowledge required before pursuing studies in specific networking fields, such as network administration, network design, and the support of specific network operating systems. This textbook and the accompanying ***Laboratory Manual*** and ***Study Guide*** meet all the required knowledge for the CompTIA Network+ Certification exam and provide the basic skills and knowledge needed to successfully enter the field of networking.

While many books on the market prepare students to pass the Network+ Certification exam, they do not take the time to explain in detail how the various network technologies work. You may be prepared for the exam, but lack the technical foundation to understand the networking technologies underlying everyday operations. In contrast, the ***Networking Fundamentals*** textbook contains detailed explanations about concepts, rather than just presentations of key points and specifications.

Many concepts may seem confusing or incomplete when first presented. As you progress through the textbook, you will learn other knowledge that will help you grasp previously presented concepts. This is why it is imperative that you constantly review previously learned subjects. Many of the concepts covered in early chapters will not become completely clear until later in the textbook. For example, throughout the textbook, references are made to protocols and the OSI model. These concepts are difficult to fully master until other concepts are presented and learned. Later in the textbook, an entire chapter is devoted to the OSI model and how it is directly related to protocols and equipment. Learning and reviewing the material presented should be a continuous process.

Be sure to visit all the recommended Web sites and perform the *Suggested Laboratory Activities*. A ***Laboratory Manual*** and a ***Study Guide*** have been designed to accompany this textbook. I strongly recommend that you complete all laboratory and study guide activities. The ***Laboratory Manual*** will provide you with a guided opportunity to perform many of the jobs required in a typical network setting. The ***Study Guide*** will provide you with a valuable means of review and practice essential for mastery of basic network knowledge and skills. By completing all activities and related class work, your opportunity for success on the Network+ Certification exam and in the workplace will be greatly enhanced.

I want to take this opportunity to wish you success in your future.

Sincerely,

Richard Roberts

The Author

For the past 35 years, Richard Roberts has been designing curriculum, teaching Electricity and Electronics as well as Computer Technology, and supervising technical teachers. Mr. Roberts is an accomplished programmer and computer technician. He has experience as the system administrator for Novell NetWare, Microsoft NT, and IBM Token Ring networking systems. He possesses a Bachelor's degree in Technical Education and a Master's

degree in Administration/Supervision. He also has current CompTIA A+, Network+, and iNet+ certifications.

His computer experiences started as early as 1974, when he began programming and teaching the Motorola 6800, which eventually evolved into the Motorola 68000—the core processor of the Apple Macintosh computer system. Since then, Mr. Roberts has maintained his teaching status to both instructors and students as the technology has evolved, and he has remained at a state-of-the-art technical level through research, teaching, and applications. He is currently an adjunct instructor at South Florida Community College. He has authored the ***Computer Service and Repair*** textbook and its ancillaries and coauthored the ***Electricity and Electronics*** textbook as well as designed and programmed the accompanying interactive CD-ROM.

In addition to his current position, Mr. Roberts has taught at Erwin Technical Center and Tampa Bay Technical High School, and he has taught adults in the military service. His time is now divided between computer consulting and applications, teaching students and instructors, and writing textbooks and other ancillary instructional materials. Occasionally, he goes fishing, but not too often.

Using This Text

Each chapter begins with a number of learning objectives. These are the goals you should set to accomplish while working through the chapter. In addition to your objectives, each chapter begins with a list of new terms, which are important for you to learn as you move through the chapter. When these new terms are introduced in the text, they are printed in a *bold italic* typeface. At that point in the text, you will find these terms defined in the margin.

As you read this text, you will also notice some other words or phrases that stand out. File names that you encounter will appear like notepad.exe, student.txt, or io.sys. Any data you must enter, be it by typing at the DOS and Run prompts or button/tabs/menus that you will click with your mouse are set out like **dir C:** or **Start | Programs | Accessories | System Tools**. Any Internet addresses within the text are in the traditional Web style and in blue, such as www.g-w.com. Internet address listed under *Interesting Web Sites for More Information* at the end of each chapter are in the traditional Web style, underlined, and in blue, such as www.g-w.com.

Be sure to read any Network+ Notes, Tech Tips, or Warnings that you encounter. Network+ Notes contain tips that will help you study for the CompTIA Network+ Certification exam. Tech Tips are useful tidbits that might come in handy in the field. Take heed when you see a Warning. Warnings alert you when an act may damage your computer, computer components, or yourself. Damaging a computer component or device through electrostatic discharge is the most common danger you will encounter with computers and networking. You may also encounter some dangerous voltages, especially when dealing with monitors. Most of those repairs should be left to special technicians.

Each chapter concludes with a summary of some of the key information you should take from the chapter, a large number of questions, a list of useful Web sites, and laboratory activities for you to try. Each chapter has two sets of questions. The first set of questions tests your general comprehension of the material in the chapter. The second set of questions mimics the style of the CompTIA Network+ Certification exam. The questions asked here are on topics that the exams commonly probe.

Hands-on experience is the only way to become proficient in networking, so be sure to attempt the activities at the end of each chapter. If you can complete the activities in this text and in the accompanying laboratory manual, you should have no problem passing the Network+ Certification exam. Each chapter concludes with a complete *Laboratory Activity*. Be sure to work through each of these activities. *Suggested Laboratory Activities* are also included. These activities are loosely structured proceedings that you can attempt on your own or if you have free time in class.

Never forget, the world of networking changes rapidly. Consequently, network administration and the CompTIA Network+ Certification exam must change with it. Each chapter includes a list of Web sites where you can find the latest information on the topics covered. Be sure to check the CompTIA Web site (www.comptia.org) frequently for the latest information on what subjects are being added to the exam and what subjects are being dropped. Also, check the author's Web site (www.RMRoberts.com) for text updates, interesting links, and bonus laboratory material.

Acknowledgments

I would like to thank the following people who helped make this textbook possible by supplying information, details, photographs, artwork, and software.

Aimee Leclerc, American Power Conversion
Ana M. Bakas, PCTEL, Maxrad Product Group
Beverly Summers, Fluke Corporation
Ed Woodward, Hewlett Packard Company
Irene Bammer, Liza Meyers, Ortronics
Sheri Najafi, WildPackets Inc.
Tamara Borg, GFI Software, LTD
Vivian Lien, SOYO Group, Inc.

I would also like to thank the following companies for supplying information, details, photographs, artwork, and software.

3Com Corporation
American Power Conversion
Fluke Corporation
Gemplus
GFI Software, LTD
Ortronics
PCTEL, Maxrad Product Group
Precise Biometrics
Siecor Corporation, Hickory, NC
SOYO Group, Inc.
WildPackets, Inc.

Trademarks

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