



# Network Management: Concepts and Practice, A Hands-On Approach

By J. Richard Burke

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Especially designed for those with limited background in network management, this volume presents the standard networking concepts and provides readers with one of the only books available to demonstrate *how to practice those concepts on a small LAN*. The manual uses a network management application that enables users to focus on the fundamentals of network management rather than components important on large production networks. The author provides an overview of network management and network management strategies, networking components, configuration client/server components and infrastructure components, as well as SNMP, RMON, RMON2 and other network management tools and initiatives. For Network Administrators, Network Managers and Network Engineers.

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### Editorial Review

From the Back Cover

The mysteries and magic of network management are revealed and simplified in this eminently practical text. The author's participatory, hands-on method introduces and demonstrates the fundamental concepts and techniques of network management. By combining applicable software with almost 400 figures and tables, Dr. Burke leads the reader through the intricacies and challenges of this increasingly important field. The text and software focus on device configuration and monitoring of network traffic, and address fault, configuration, performance, and security management.

This is the first textbook that shows students and professionals how to implement network management concepts. The companion software enables instructors to demonstrate basic techniques while allowing students unlimited practice opportunities to master them. A multitude of tables illustrate network implementation and management strategies.

### Features

- Provides step-by-step configuration of desktop and network devices.
- Explains the use of SNMP packets to "Get" and "Set" standard objects.
- Comprehensively discusses RMON and RMON2 MIBs and uses them to display and analyze network traffic.
- Explains the new SNMPv3 standard and demonstrates how to use it to configure SNMPv3 agents and provide authentication and encryption of SNMPv3 messages.
- Demonstrates desktop and Web-based management protocols.
- Demonstrates how to access, compile and use device-specific enterprise MIBs.

About the Author

**J. Richard Burke** has written well-received textbooks that cover TCP/IP, Windows NT 4.0 Server, and C and C++. He has developed training manuals for the Novel NetWare operating system and LAN and WAN networking and has authored more than 40 technical publications. Currently, his own company develops computer networking training materials and he is Adjunct Professor in the Electrical and Computer Engineering Department at North Carolina State University. Dr. Burke is past chair of the Computer Society Publications Committee and has received the Society's Meritorious Service Award. He is a senior member of The Institute of Electrical and Electronics Engineers.

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The title of this book is *Network Management: Concepts and Practice. A Hands-on Approach*.

### A NEW APPROACH

*Network Management: Concepts and Practice. A Hands-on Approach* uses Network Management System (NMS) software to demonstrate each network management concept described. Thus, it shows the student how to practice network management. In addition to the demonstrations illustrated in the book, we arranged

to include the NMS used for the demonstrations with the book. Therefore, students will be able to practice network management techniques at any time.

## **NETWORK MANAGEMENT PROTOCOLS IMPLEMENTED**

This book concentrates on the implementation of the Simple Network Management Protocol (SNMP) because of its pervasive use in the enterprise. Most of this use is provided by SNMPv1. In addition, we give a complete description of SNMPv3 and demonstrate its use. SNMPv3 is now an Internet Standard that provides "industrial strength" authentication and encryption. The student is also introduced to the use of the Desktop Management protocol and Web-based Management.

## **SUMMARY OF FEATURES**

- Uses an NMS that focuses on the fundamentals of network management
- Describes the responsibilities of a network manager
- Provides step-by-step configuration of desktop and network devices
- Provides comprehensive descriptions of RMON1 and RMON2 MIBs and uses them to display and analyze network traffic
- Provides tables which organize the details of network implementation and management strategies
- Provides tables that divide the broad range of network management concepts into manageable descriptions
- Demonstrates how to access, compile and use device-specific enterprise MIBs
- Provides a summary of commercial NMSs categorized by capability and cost
- Includes over 300 figures that demonstrate network management details.
- Includes Review Questions and Exercises at the end of each chapter

## **CONTENT OVERVIEW**

Readers of this book should have had a course in networking fundamentals or experience in that area. However, for those needing some review, we have included Chapter 1 that provides an overview of networking components. In addition, Chapters 2 and 3 introduce the reader to network management vocabulary and the basic principles of network management.

Chapter 1 provides an overview of networking concepts, shows photographs of the devices that will be used on the demonstration network, and explains the functions of the devices.

Chapters 2 and 3 describe what network management is all about. Chapter 2 discusses the responsibilities of a network manager, defines network management vocabulary, provides an example of how remote network management is done and documents the history of network management development. Chapter 3 discusses network implementation and network management strategies and gives tables of issues that should be considered for each. Also described are the ISO Network Management Categories and examples of each are given. In addition, the chapter summarizes the capabilities and costs of current network management systems (NMS). Finally, different network management strategies are examined and one selected for this book.

Chapters 4 and 5 provide step-by-step configuration of demonstration network components. Chapter 4 configures desktop components and Chapter 5 configures network components such as hubs, switches, routers, and probes.

Chapter 6 examines details of the SNMPv1 protocol, the structure of the MIB tree, explains SNMPv1 commands and arguments, uses a command line utility to execute SNMPv1 commands, introduces the Meterware/Analyzer NMS, and captures and analyzes SNMPv1 frames.

Chapter 7 explains the Structure of Management Information (SMIv1), the ASN.1 definitions of MIB objects and how to create them, and implements enterprise objects.

Chapters 8 and 9 examine RMON1 and RMON2 MIB objects and how to use an NMS and a probe to capture and analyze objects that measure network traffic statistics. RMON2 objects provide traffic statistics for protocols up to the Application Layer.

Chapters 10 and 11 describe other important network management protocols. Chapter 10 discusses the Desktop Management Interface (DMI) standard, demonstrates how it is used to access desktop attributes, and how the desktop attribute format can be mapped to the MIB format for remote access by an NMS that uses SNMPv1. Chapter 11 discusses Web-based management and demonstrates the use of a web browser to access object values from an embedded SNMPv1 web server on a Cisco switch.

Chapter 12 demonstrates configuration and use of SNMPv3, the new IETF Standard for authentication and encryption of SNMP messages. David Spakes of SNMP Research International co-authors this chapter. The history of the transition from SNMPv1 to SNMPv2 to SNMPv3 is reviewed, operational enhancements in SNMPv2 are explained and authentication of users and encryption of messages for a SNMPv3 agent are demonstrated using a SNMPv3 command line interface. In addition, the chapter uses a GUI Wizard, in development at SNMP Research, to configure authentication for a SNMPv3 agent, demonstrates the SNMPv3 Enterpol NMS in development at SNMP Research and shows how to use the Enterpol application, Simple Policy Pro, to distribute configurations throughout the enterprise.

Six Appendices are included that support chapter material, provide advanced material, and provide an essential reference for the student. Appendix A reviews IP addressing and subnetting. Appendix B supports Chapter 7 by providing additional material on Abstract Syntax Notation 1 (ASN.1). Appendix C is rfc 1213 which is a description of each of the objects in MIB-II. Appendix D explains the Basic Encoding Rules used to create packets sent over the "wire." Appendix E describes other approaches to information management that are in use today and Appendix F demonstrates other useful tools on the CD-ROM.

## **Users Review**

### **From reader reviews:**

#### **William Nix:**

The particular book Network Management: Concepts and Practice, A Hands-On Approach will bring one to the new experience of reading some sort of book. The author style to describe the idea is very unique. In case you try to find new book to learn, this book very suitable to you. The book Network Management: Concepts and Practice, A Hands-On Approach is much recommended to you to learn. You can also get the e-book in the official web site, so you can easier to read the book.

#### **Samantha Flowers:**

Reading a reserve tends to be new life style in this era globalization. With looking at you can get a lot of information that can give you benefit in your life. Using book everyone in this world can share their idea. Guides can also inspire a lot of people. Plenty of author can inspire their particular reader with their story or even their experience. Not only the storyplot that share in the books. But also they write about the data about something that you need example of this. How to get the good score toefl, or how to teach your children,

there are many kinds of book that exist now. The authors these days always try to improve their proficiency in writing, they also doing some exploration before they write to their book. One of them is this Network Management: Concepts and Practice, A Hands-On Approach.

**Chad Brown:**

Network Management: Concepts and Practice, A Hands-On Approach can be one of your beginning books that are good idea. Many of us recommend that straight away because this reserve has good vocabulary that may increase your knowledge in vocabulary, easy to understand, bit entertaining but nevertheless delivering the information. The article writer giving his/her effort to set every word into satisfaction arrangement in writing Network Management: Concepts and Practice, A Hands-On Approach although doesn't forget the main position, giving the reader the hottest in addition to based confirm resource data that maybe you can be considered one of it. This great information can certainly drawn you into brand new stage of crucial contemplating.

**Dwight Hancock:**

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