

NETWORKING

# Computer Networking from LANs to WANs: Hardware, Software, and Security

Kenneth C. Mansfield Jr.  
James L. Antonakos





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**James L. Antonakos**

 **COURSE TECHNOLOGY**  
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Security**

**Kenneth C. Mansfield, Jr. and  
James L. Antonakos**

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*To our readers, who make everything possible.*



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# Preface

Computer networks are everywhere. They span the globe, interconnecting with each other, weaving a web of communication that extends outward to the domain of satellites orbiting above the earth. They fail; they heal themselves; they move staggering amounts of information between distant locations in an instant. They are in our schools, our businesses, and our homes.

The purpose of this textbook is to explain the mystery behind the computer network, its hardware and software components, how it connects with other networks, the services it provides, network design and implementation, how network problems can be solved, and the security aspects of networking and computing. Concepts and techniques are presented through real-world examples (such as examining all the packets captured while loading a Web page or sending e-mail). Whenever possible, the Internet is used to explain a new network service or mechanism. This includes heavy use of various sites located on the World Wide Web. We describe how many of the networking concepts are used in several network client-server applications, including a virtual reality network maze game (NetMaze), Java applets, and CGI programming examples.

## **Intended Audience**

This book is suitable for all readers with an interest in computer networking and especially students in computer engineering technology, electrical engineering technology, networking technology, information technology, telecommunications technology programs, corporations, and the government.



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