**DESCRIPTION**

An authoritative introduction to the roles of switching and transmission in broadband integrated services networks

*Principles of Broadband Switching and Networking* explains the design and analysis of switch architectures suitable for broadband integrated services networks, emphasizing packet-switched interconnection networks with distributed routing algorithms. The text examines the mathematical properties of these networks, rather than specific implementation technologies. Although the pedagogical explanations in this book are in the context of switches, many of the fundamental principles are relevant to other communication networks with regular topologies.

After explaining the concept of the modern broadband integrated services network and why it is necessary in today’s society, the book moves on to basic switch design principles, discussing two types of circuit switch design—space domain and time domain—and packet switch design. Throughput improvements are illustrated by some switch design variations such as Speedup principle, Channel-Grouping principle, Knockout principle, and Dilation principle.

Moving seamlessly into advanced switch design principles, the book covers switch scalability, switch design for multicasting, and path switching. Then the focus moves to broadband communications networks that make use of such switches. Readers receive a detailed introduction on how to allocate network resources and control traffic to satisfy the quality of service requirements of network users and to maximize network usage. As an epilogue, the text shows how transmission noise and packet contention have similar characteristics and can be tamed by comparable means to achieve reliable communication.
Principles of Broadband Switching and Networking is written for senior undergraduate and first-year postgraduate students with a solid background in probability theory.

ABOUT THE AUTHOR

TONY T. LEE, PhD, is Professor of Information Engineering at the Chinese University of Hong Kong and an Adjunct Professor at the Institute of Applied Mathematics of the Chinese Academy of Science. From 1991 to 1993, he was a professor of electrical engineering at the Polytechnic Institute. Previously with AT&T Bell and Bellcore, Dr. Lee was the recipient of the Leonard G. Abraham Prize Paper Award from IEEE Communication Society in 1988, and the National Natural Science Award from China in 1999. He is a Fellow of IEEE and now an associate editor of the IEEE Transactions on Communications.

SOUNG C. LIEW, PhD, is Professor and Chairman of the Department of Information Engineering at the Chinese University of Hong Kong. He is also Adjunct Professor at Southeast University in China. TCP Veno, a version of TCP that improves its performance over wireless networks, was proposed by Liew and his student, and has now been incorporated into a recent release of Linux OS. He initiated and built the first inter-university ATM network testbed in Hong Kong in 1993.

FEATURES

• Provides a strong mathematical basis for the study and research of broadband integrated networks.

• Moves seamlessly from discussion of basic design principles to advanced switch design principles.

• Gives reader-accessible parallels between broadband integrated networks and other systems.

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