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Sommario/riassunto

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.
