

Preface

The Full Service Access Network (FSAN) working group, established by major telecommunications service providers and equipment vendors in 1995, has been advancing specifications into appropriate standard bodies, primarily ITU-T and IEEE, through which many standards have been defined and driven into passive optical network (PON) services and products. PON, which exploits the potential capacities of optical fibers, has also been identified as a promising future-proof access network technology to meet rapidly increasing traffic demands effectuated by the popularization of Internet and the sprouting of bandwidth-demanding applications. Tremendous amount of research and development efforts have since been made to advance PON.

This book is intended to provide a quick technical briefing on the state of the art of PON with respect to, in particular, media access control (MAC) and resource management. It consists of nine chapters: Chap. 1 provides the landscape of existing broadband access technologies; Chap. 2 traces the evolution of PON architectures from APON to OFDM PON; Chaps. 3–5 cover MAC and resource allocation in GPON, EPON, and WDM PON, respectively; Chaps. 6–8 cover recently zealously pursued topics, namely, OFDM PON, hybrid optical and wireless access, and green PON; and Chap. 9 presents the concluding remarks and points to future research and development endeavors. While Chaps. 1 and 2 provide rudimentary overviews, the material of the book is structured in a modular fashion, with each chapter reasonably independent of each other. Individual chapters can be perused in an arbitrary order to the liking and interest of each reader, and they can also be incorporated as part of a larger, more comprehensive course. The first author has adopted some material presented in this book for his graduate courses, ECE 639 Principles of Broadband Networks and ECE 788 Advanced Topics in Broadband Networks. The book may also be used as a reference for practicing networking engineers and researchers.

Newark, NJ
Santa Clara, CA

Nirwan Ansari
Jingjing Zhang