Abstract—In order to enhance the bandwidth utility and lower constructing and maintaining costs of public access networks, this paper introduces bus FTTH networks in order to deploy FTTH network with distributed control and bus topology. After the unfair-access problem on optical-bus distributed-control TDMA networks was resolved, bus FTTH network consisting of two optical-bus distributed-control TDMA networks has been presented. This paper compares bus FTTH networks with FTTH EPONs. Bus FTTH networks applied distributed-control mechanism to control access in order that the merit of FTTH is evidently revealed. FTTH EPONs adopts centralized-control mechanisms which consume and waste bandwidth so that the merit of FTTH networks is debased. Otherwise, the constructing and maintaining costs of bus FTTH networks are much lower than FTTH EPONs. Therefore, bus FTTH networks are appropriate to be adopted in the all-fibre optical access environment in which every home is attached to a unit of optical fibres regardless of the size of the required bandwidth of homes.

Keyword—Distributed control, Optical-fibre communication, Time-division multiple access, Medium access control protocols.

Rong Nan Chiou (M’11) was born in Tainan City, Taiwan on September 20, 1951. He received the B.S., M.S., and Ph.D. degrees in electrical engineering from National Cheng Kung University, Tainan, Taiwan, in 1985, 1988, and 1993, respectively. From 1975 to 1999, he was with the South Taiwan Telecommunication Administration, working with switching systems and data communications. He was an Associate Professor of electronic engineering at Kun Shan University, Tainan, Taiwan from 2000 to 2007. He is retiring since 2007. His current research interests include networking and data communications.