A Study on Decentralized Passive Optical Networks

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ABSTRACT

Ethernet passive optical network (EPON) is an emerging access network technology that provides a low-cost method of deploying optical access lines between a carrier ’s central office and a customer site. In the downstream transmission, the optical line terminal (OLT) located at the central office broadcasts frames, and those remote optical network units (ONUs) selectively receive frames addressed to themselves. In the upstream transmission, time division multiplexing access (TDMA) is used to avoid frame collisions. Since the upstream bandwidth is dynamic arranged by OLT, this design leads to some bandwidth wastes on control messages and slow answer of bandwidth requirement for ONUs. Foh et al. [1] proposed a decentralized EPON architecture: FULL-RCMA. However, when there are many ONU to ONU communications, both EPON and FULL-RCMA waste bandwidth on upstream direction. So we develop a new decentralized EPON architecture DLT-PON to provide higher upstream utilization for enterprise or campus networks.

Keywords : Ethernet passive optical network (EPON)

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