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PERFORMANCE OF A THRESHOLD-BASED DYNAMIC PRIORITY BANDWIDTH ALLOCATION SCHEME IN METRO AREA NETWORKS

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Abstract. In this paper, we probe into the traditional multiple class selective discard scheme and Multiple Class Buffer Priority (MCBP) algorithm based on the Markov Modulated Poisson Process (MMPP) traffic, analyse the impact of the arriving traffic with long-duration burstiness on multi-priority system performance. Then, a threshold-based dynamic priority bandwidth allocation scheme suitable for SDH/SONET-based Metro Area Networks is proposed, the use of threshold decreases about 50of the scheme is tractable and can provide relatively accurate result, which is suitable for the burstiness circumstance under the model of SDH/SONET-based MANs. We verify the effect of dynamic bandwidth allocation under the restriction of threshold through simulation, the result shows that the TDPBA scheme can guarantee the high QoS service getting efficient transmission bandwidth in the premise of sacrificing the performance of low priority service.

Keywords. MCBP, MMPP, TDPBA, SDH, MANs.

1 Introduction

SDH/SONET-based Metro Area Networks (MANs) meets the flexible bandwidth and quality of service (QoS) requirements of streaming media services by statistically multiplexing of different traffic types [1]. Recently, there has been great interest in extending these capabilities to Ethernet over SDH/SONET networks in Metro area. The main objective is to achieve an efficient utilization of the SDH/SONET channel through appropriate scheduling of a variety of traffic classes with different burstiness characteristics and QoS requirements, because of the limitation of bandwidth that available to support streaming media application of multiple users. SDH/SONET-based MANs is faced with the bottleneck of service development and great capacity of bandwidth requirement, which brings challenges to the scheduling and allocation capability of the network.

Much research work on streaming media shows that the real time variable bit rate (VBR) video traffic has typically long-duration burstiness [2], which is