Manycast Service in Optical Burst/Packet Switched (OBS/OPS) Networks (Invited Paper)

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Abstract. Recently there is an emergence of many Internet applications such as distributed interactive simulations (DIS), and high-performance scientific computations such Grid computing. These applications require huge amount of bandwidth and a viable communication paradigm to co-ordinate with multiple sources and destinations. In this work we propose variation of multicasting called quorumcasting or manycasting. In many-casting destinations are to be determined rather than given unlike in the case of multicasting. We first present a need to support manycasting over OBS networks. Quality of Service (QoS) policies implemented in IP does apply does not apply for optical burst switched (OBS) networks, as the optical counterpart for store-and forward model does not exist. Hence there is a need to support QoS for manycasting over OBS networks. In this work we focus on QoS parameters such as contention, optical signal quality, reliability, and propagation delay. Burst loss in OBS network can occur due to contention or bit-error rate (BER). We propose algorithms to decrease the overall burst loss. We show that IP based manycasting has poor performance compared to our proposed algorithms. Our simu-lation results are verified with the help of analytical model. This work is further extended as to multi-constrained manycast problem (MCMP). In this problem, we address the burst scheduling for multiple QoS con-straints. We propose algorithms to minimize burst loss based on given service requirements. The goal of this work is to develop service-oriented optical networks (SOON) for many emerging Internet applications.

Keywords: WDM, QoS, GoOBS, Manycasting.

1 Introduction

There has been an recent emergence of many Internet applications such as multimedia, video conferencing, distributed interactive simulations (DIS), and high-performance scientific computations like Grid computing. These applica-tions require huge amount of bandwidth and a viable communication paradigm