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# Class of Service based OBS Multicast Traffic Routing Considering Node Capabilities

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Node Capability based multicast communication in Optical Burst Switched Networks was dealt before. This heuristic was based on consideration of specialized nodes called as Virtual Sources (VS). It aimed at exploiting the capabilities of VS nodes in order to reduce number of failed requests, thus reducing number of Burst retransmissions required. The architecture was proved good mathematically and well as through simulation experiments. Based on this node capability based heuristic, multicast destinations were classified into priority classes as Class S, Class A, Class B and Class C in this paper. While configuring the multicast tree, for all destinations belonging to the high priority class the VS must not be considered as these high priority nodes are comparatively much harder to secure.

**Keywords :** All-Optical Networks, Multicasting, Optical Burst Switching, Wavelength Division Multiplexing.

## 1. INTRODUCTION

Internet users grow exponentially with increase in Real-Time and mission critical applications requiring huge bandwidth such as VoIP, telemedicine, remote learning, video conferencing, interactive simulations *etc.*, [1]. This phenomenal increase has motivated to replace the existing copper cables by optical fibers at the backbone. Also, an Optical fiber could support Terra Hertz bandwidth with extremely minimal losses as they are totally immune to electrical interferences and is almost impossible to tap. Data in an optical network is transmitted in the form of light waves. A light wave, which contains photons, has higher frequency than the electrons and hence shorter wavelengths thus allowing more bits of data to contain in an optic fiber than a copper cable.

An Optical fiber posses lower Bit Error Rate (BER) thus totally immune to light interference. There are two generations in optical networks and they are :

- First Generation Optical Networks
- Second Generation Optical Networks

Point-to-point connections are established in the former and so the entire potential of an optical fiber could not be utilized. The electronic routers are too slower than optical ones and thus are in synch with this. Wavelength Division Multiplexing (WDM) technology, were predominant in the latter generation optical networks. WDM divides the available optical fiber bandwidth to number of non-overlapping wavelength channels while each channel operates at electronic speed. To carry TCP/IP traffic over Optical WDM networks there are three switching architectures and they are :

- Optical Circuit Switching (OCS)

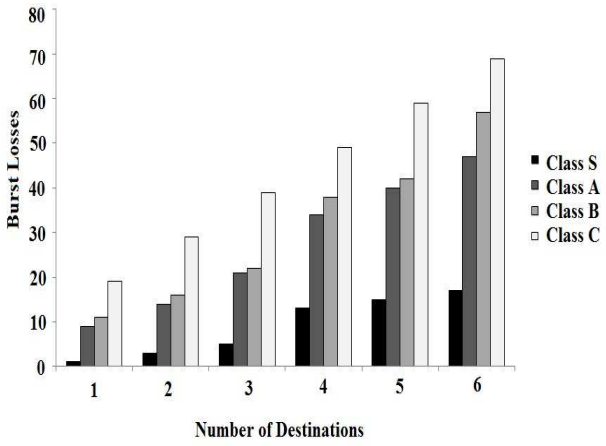


Figure 9. Burst Losses vs Number of Destinations

the number of destinations increases we find increase in Burst Losses for all CoS destinations in Figure 9.

## 5. CONCLUSIONS

Optical Burst Switched networks when employed at the cores has the potential to effectively utilize the vast bandwidth provided by the WDM Networks. From the graphical results, delivering Differentiated services to multicast destination was simulated successfully using ns2 with modified OBS patch by classifying the destinations as Class S, Class A, Class B and Class C based on decreasing priority. Several experiments were conducted and the results prove that differentiated services are achieved with higher throughput and minimum delay for destinations belonging to higher classes in comparison to lower class destinations. A proper quantification for unicast request (*i.e.*, with a single destination in a destination group) as well as for 2, 3, 4 and 5 destinations in a group were simulated and results are obtained thus providing CoS for destinations.

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