

## TRANSMISSION OF OPTICAL BURSTS USING SWITCHES WITH WAVELENGTH CONVERSION

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As the network faces increasing bandwidth demand on the Internet, the All-Optical Network (AON) is a crucial milestone. Optical bursty level switching is a promising technology for making AON practical. Though, many switch architectures have been proposed, deploying fast and cost-effective switches is a major problem to commercialize bursty level switching technology. A problem for deploying bursty level switching with the existing traditional optical switches (TOS) is they are not fast enough. Therefore, they cause long waiting times at source nodes and considerable burst contentions at core nodes. A recent research in this context has investigated a different switching approach by observing the fundamental limitations seen in TOS. It has provided a new switching architecture based on variable optical splitters (VOS). Unlike TOSs, VOSs avoid the requirement of time gaps between bursts for switch configuration to switch bursts. Hence, it forms potential benefit as they reduce waiting time for bursts on queues at ingress/source nodes.

Although the previous work achieves better delay performances, there are still obstacles in terms of blocking performance. Mainly it shows high burst loss values at high loads at certain traffic flows that are very similar to the TOS performances. Therefore the gain in terms of the delay – load performance cannot be realized in some scenarios especially at high loads, because of high blocking. These limitations can be overcome to a considerable extent with the use of wavelength converters. We consider the wavelength conversion on this recently proposed switch for the first time. To support the wavelength conversion, we modified the existing switching architecture and the switching method. Our solutions are investigated using simulation studies. The simulation results show that significant improvement in terms of the blocking performances is seen with wavelength conversion even at very high loads. Furthermore, the gain in terms of blocking reduction increases with the number of wavelengths. These outcomes verify that (1) the wavelength conversion can be used as an effective technique with the recently proposed switch architecture to reduce blocking significantly even at very high loads, and (2) therefore, this technique helps realize the benefits in terms of the delay-load performance which is observed at very high loads.