Abstract

Performance of existing TCP implementations over Optical Burst Switched (OBS) networks is not satisfactory, as they suffer from false congestion detection. As the contention induced losses are more common than congestion induced losses in OBS, the TCP reduces the congestion window even when there is no congestion. This effect, in turn unnecessarily reduces the TCP throughput. So it is crucial to differentiate the contention induced loss from congestion induced loss in such networks. It has been proposed in this paper, a mechanism that makes use of short-term RTT variation and assembly times of individual TCP segments to differentiate between congestion and contention induced losses. This mechanism is a cross layer modification of a congestion control scheme called Statistical Additive Increase and Multiplicative Decrease (SAIMD). Our proposed scheme is found to be more efficient than existing one in terms of TCP throughput. The gain in throughput is primarily because of avoidance of misdirection of contention induced loss as congestion induced loss. A throughput-cost study has been conducted based on the throughput metric available from the efficiency analysis of our proposed scheme. The cost model used focuses on initial capital expenditure including switching, routing and amplification cost. An extension of ns2 called
nOBS, to support OBS protocol is used for simulation to study the performance.

References

Cost-Throughput Analysis of a Modified TCP for Optical Burst Switched Networks


Index Terms

Computer Science

Communication Systems

Keywords

OBS Modified TCP congestion induced loss contention induced loss