A Proactive Transport Protocol for Performance Enhancement of Satellite based Networks

Abstract

Current TCP Protocols have lower throughput performance in satellite networks mainly due to the effect of long propagation delays and high link error rates. In this paper a new congestion control protocol for satellite networks is proposed. The protocol uses a proactive approach and is composed of novel ideas like Proactive Slow Start, Proactive Congestion Avoidance and Decision based Error handling policies that are combined with traditional TCP algorithms like Fast Retransmit. The mainstay of our protocol is that the nature of the RTT pattern can give us probable indication of an incipient congestion in the network. This changing pattern of RTT is incidentally used to differentiate between congestion or link error, thus avoiding unnecessary rate throttle. In the initial phase necessary augmentation of ns2 simulator pertaining to the proposed protocol is carried out. This was essential to create a necessary test bed for exhaustive simulation of the protocol considering a GEO network with different congestion level and packet error rate. Simulation results show that the protocol always outperforms other TCP schemes in terms of goodput and in cases an improvement of 80% to
120% is observed especially when the packet error rate is very high. Evaluation of the protocol shows a high fairness property and excellent adaptability to high levels of congestion and errors.

Reference

- Injong Rhee and Lisong Xu, IEEE ACM T NETWORK, 2007, Limitations of Equation-based Congestion Control

Index Terms

Computer Science Communication

Network

Key words

SACK

Vegas

GEO

PER

RTT

Proactive Protocols

GEO

PER

RTT