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SOFTWARE DEFINED NETWORK ARCHITECTURE FOR SATELLITE NETWORKS WITH INTER-SATELLITE LINKS

Abstract

The IP based routing and forwarding technology provide a very convenient way to establish highly interconnected space networks for satellites with inter-satellite links. However, it is very difficult to do traffic engineering between different inter-satellite links using the IP's forwarding policy employing distributed network state sensing and decision making. Software Defined Network (SDN) provides a new approach to perform traffic engineering function for satellite networks. The SDN decouples data plane functions from control plane functions, and have a global view of the network traffic and bandwidth resource distribution that enables dramatically improvement of inter-satellite links resource utilization. In this paper, we introduce SDN into satellite networks, and establish a centralized control plane model for satellite networks with inter-satellite links. We show, by simulations, the satellite network SDN architecture can achieve better network capacity utilization performance gains than the traditional IP architecture.