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MAXIMIZING THE POTENTIAL OF SATELLITE NETWORKS IN COMBINATION WITH TERRESTRIAL NETWORKS FOR RELIABLE CONNECTIVITY

Abstract

Satellite-based networks are known to experience high latency issues, making them less appealing to end-users when compared to traditional terrestrial network. However, when satellite connections are combined with traditional approaches, they can provide more efficient and reliable connectivity, thereby becoming a valuable addition to the existing network infrastructure.

One of the primary benefits of satellite networks is their ability to offer redundancy and emergent capacity increase. This is critical in ensuring network availability and reliability, especially during disasters or emergencies. To achieve this, Internet Service providers (ISPs) can implement routing protocols that effectively manage the flow of data between satellite and fiber optic connections, minimizing the impact of latency on network performance and user experience. The challenge, however, lies in overcoming the latency in satellite communication. To achieve this, ISPs can implement routing protocols that effectively manage data flow, minimizing the impact of latency on network performance and user experience. One approach to routing in satellite-based networks is the hybrid routing model, which combines traditional terrestrial routing with satellite routing. Implementing Quality of Service (QoS) mechanisms on satellite-fiber hybrid networks can prioritize real-time traffic, such as video conferencing or gaming, over other types of traffic, reducing latency and improving user experience. This, combined with routing protocols and load balancing, can create a reliable and efficient network infrastructure. This approach creates more robust and resilient network infrastructure, enabling ISPs to leverage the benefits of both traditional and satellite-based networks. Redundancy and backup connectivity are also critical in satellite-based networks to ensure network availability and reliability. Load balancing is another technique that can be used to route different types of data packages through different connections to maximize the use of available bandwidth and improve network performance.

In conclusion, combining traditional and satellite-based networks can create a more robust and resilient network infrastructure that offers redundancy and emergent capacity increase. By implementing appropriate routing protocols and load balancing techniques, ISPs can minimize latency and provide high-speed connectivity across large geographical areas. The objective of this paper is to explore the potential of combining satellite and traditional networks and highlight the benefits of this approach, as well as identify use cases where such a network infrastructure can be particularly effective.