

The Impact of QUIC on SATCOM PEP and Traffic Classification

The Networking Channel

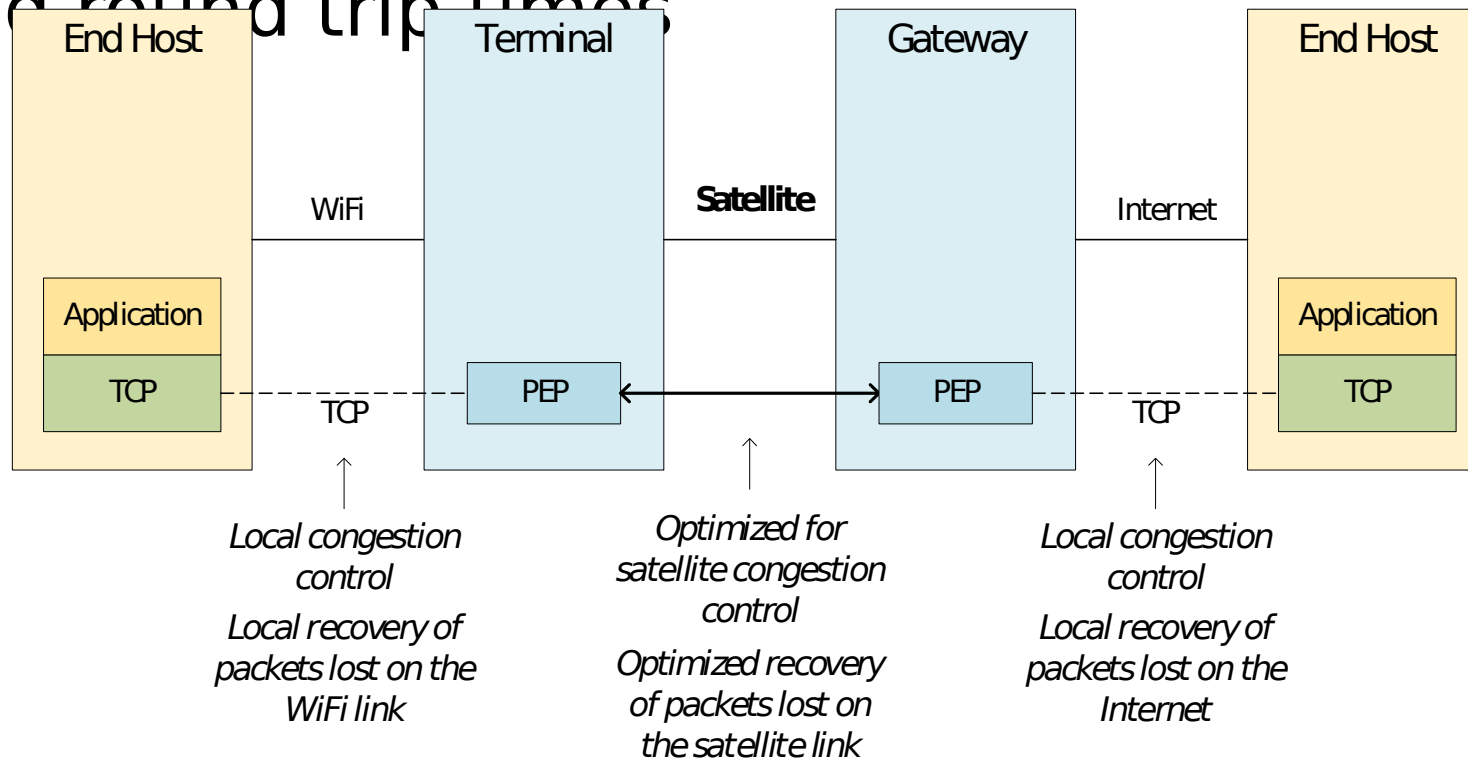
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SATCOM Performance Enhancing Proxies

- The goal is to achieve 100 Mbps (or greater) download and 10 Mbps (or greater) upload speeds even with up to 1 second round trip times



Why Does SATCOM Use PEPs?

- Performance Enhancing Proxies are used to speed up slow start and congestion recovery
 - Local acknowledgements on each side of the spacelink hide the satellite latency to speed up window growth
- PEPs are used to improve error recovery from lost packets:
 - Local error recovery (hiding the overall end to end latency) from packets dropped outside the satellite network
 - Particularly important for packets dropped in Wi-Fi networks at the end user's site
 - Optimized for the satellite link error recovery for packets dropped crossing the satellite network

Traffic Classification

- From [Wikipedia](#)

Traffic classification is an automated process which categorises (sic) computer network traffic according to various parameters (for example, based on port number or protocol) into a number of traffic classes.^[1] Each resulting traffic class can be treated differently in order to differentiate the service implied for the data generator or consumer.

Reference [1] is [RFC 2475](#) – An Architecture for Differentiated Services

- Classification is primarily based on transport header and application header information
 - TCP and UDP port numbers are the most basic classifiers

The “First Mile”

- For network operators, traffic classification is important for meeting customer service expectations
 - Traffic classification and PEP work hand in hand
- The last mile is really the first mile when it comes to traffic classification
 - The network for which classification is most important is the one to which the end user is directly connected
 - Besides prioritizing (e.g.) interactive over background traffic with respect to available resources the network device may even have multiple paths with different characteristics available to it

QUIC Encryption

- Encryption is mandatory for QUIC (for good reasons)
 - QUIC encrypts not just the payload but also the transport header information
- Encryption hides the transport and application information used for performance and enhancement and classification
 - Slow start and congestion control must operate end to end
 - Error recovery must happen end to end
 - All traffic looks the same making classification difficult