Transport Layer Protocols Optimization for Satellite Networks(T4SAT) Side Meeting

IETF 123 Madrid

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- BCP 25 (Working Group processes)
- BCP 25 (Anti-Harassment Procedures)
- BCP 54 (Code of Conduct)
- BCP 78 (Copyright)
- BCP 79 (Patents, Participation)
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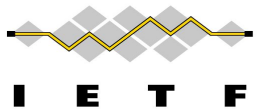

Motivation

- LEO/MEO networks (e.g., Starlink, OneWeb) are rapidly developing in recent years, providing new ways for Internet accessing.
- LEO/MEO networks have the characteristic of high dynamic, which cause packet disorder or loss, unlike terrestrial networks.
- This directly impacts user experience if the transport layer don’t handle it well.
- IETF has related work to satellite network, TVR, DTN, TIPTOP.
- However, systematic optimization of core transport layer for LEO/MEO specifics is not deeply discussed or explored.
- This meeting is about promoting broader thinking of if the transport layer protocols need to be optimized for LEO/MEO networks.

Recap. of the Sidemeeting in IETF-122

1 **Transmission requirements & challenges in the large-scale satellite constellation network**
- General discussion
- Challenges: Topology dynamics, TCP/UDP out-of-order, RTT fluctuation, path switchover, high BER
- Potential schemes: Multi-path, packet-level encoding, cross layer notification, congestion control

2 **Handover behaviors of LEO satellite networks and impacts on the transport-layer protocols of the Internet**
- Focused on Starlink: real-measurement, transport-layer Opt., video adaptation
- Briefly compared with OneWeb

3 **LEO Satellite vs. Cellular Networks: Exploring the Potential for Synergistic Integration**
- Focused on Starlink, and compare with mobile networks; could complement each other
- Potential with multipath technologies (MPTCP, MP-QUIC); done investigation

The takeaway from the previous sidemeeting (via open discussions): 1. An interesting & practical issue ; 2. having real field requirements;
Suggestions: Maybe involve more industrial players directly.

Agenda

	Topic	Time(mins)	Presenter	Company
0	Welcome & Review	5	Yisong Liu	China Mobile
1	Transport Optimization in Satellite Networks: - 3GPP Use cases, Challenges & Considerations	10	Tianji Jiang	China Mobile
2	Manipulating Congestion Control To Improve Video Streaming Over Starlink	10	Liz lzhikevich	UCLA&Netflix
3	Thoughts on LEO scenarios and requirements	10	Jie Liu	Geely
4	Technical Considerations for T4SAT	10	Quan Xiong	ZTE
5	Open Discussion	30	All	

Questions List

- Questions to Have in Mind You don't have to answer these questions, but please think about them for the discussion at the end of the meeting. (not limited to these questions)

1. is the problem to optimize transport layer protocols for LEO/MEO well understood?

   is the problem space to optimize transport layer protocols for LEO/MEO well defined?

   Is there a need to optimize transport layer protocols for LEO/MEO?
2. For the Satellite (LEO/MEO) based problem space, are there any design & implementation challenges in term of the transport layer optimization that are not yet considered by TCP/QUIC?
3. The relationship between what we are discussing now (i.e., LEO/MEO based transport) and those exiting IETF WGs (DTN, CCWG, TIPTOP)? – adjacency relationship
4. Is anyone willing to contribute early implementations or evaluate results?
5. Further actions?