

Small Island, big potential

- In this paper, researchers discussed methods to improve satellite internet's performance such as speed, latency and reliability.
- They compared the difference between two main internet connection protocols - Transmission Control Protocol (TCP) and User Datagram Protocol (UDP).
- They undertook a simulation, collected data and came up with a potential solution.

In an ever-changing world, it is essential for having access to all the information ones' need. However, in many remote parts of the world, such as remote islands, planes, ships or even the International Space Station (ISS), don't have access to undersea internet cable. Thus, the internet comes solely from satellites. However, they are usually slow and unreliable.

The researchers have discovered that by configuring protocols used by satellite internet have the potential to improve their performance. When connected to the internet, **two** protocols are usually used: TCP and UDP. TCP is usually favoured by the internet providers for its "Back off when lost packet" algorithm which makes communication more stable, while UDP is usually blocked.

However, flows that didn't deliver successfully are called "solid flow". They waste time and resources. They "behave" similarly to UDP flows except they fail to deliver packets and they have to wait until timeout to be terminated. After the simulation, researchers found out that solid flow accounts for about 10-12% of all flows, highly similar to the percentage of UDP flows in all flows, which is around 12%. Thus, they argue that not much has gained from blocking UDP flows, especially for satellite internet which usually has a moderate RTT (Round Trip Time). With such high RTT, latency becomes more important than conventional undersea optic cable, which highlights the benefits of UDP even more. Thus, for the conclusion, unblocking UDP might be a more reasonable move.

Questions

- If you are one of the satellite internet providers, what would you do?
- Researchers undertook the simulation with the help of the Auckland Satellite TCP/IP Traffic Simulator. Neglect the cost, would you prefer the simulation to be carried out with real users, senders and receivers (World) as an experiment?
- Space X's upcoming Starlink service also provides internet connection through satellites. However, they are LEO satellites which means they orbit in lower earth orbit (~500 km), much lower than the altitude of MEO or GEO satellites. Do you think that Starlink service will have a lower latency than current conventional undersea optic cable?