Satellite / Terrestrial Multipath Communication
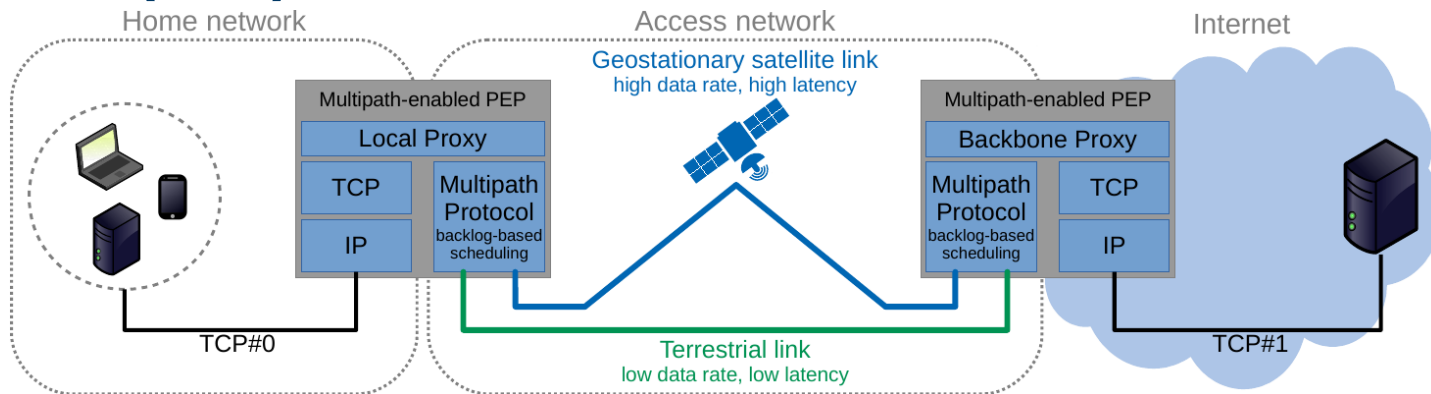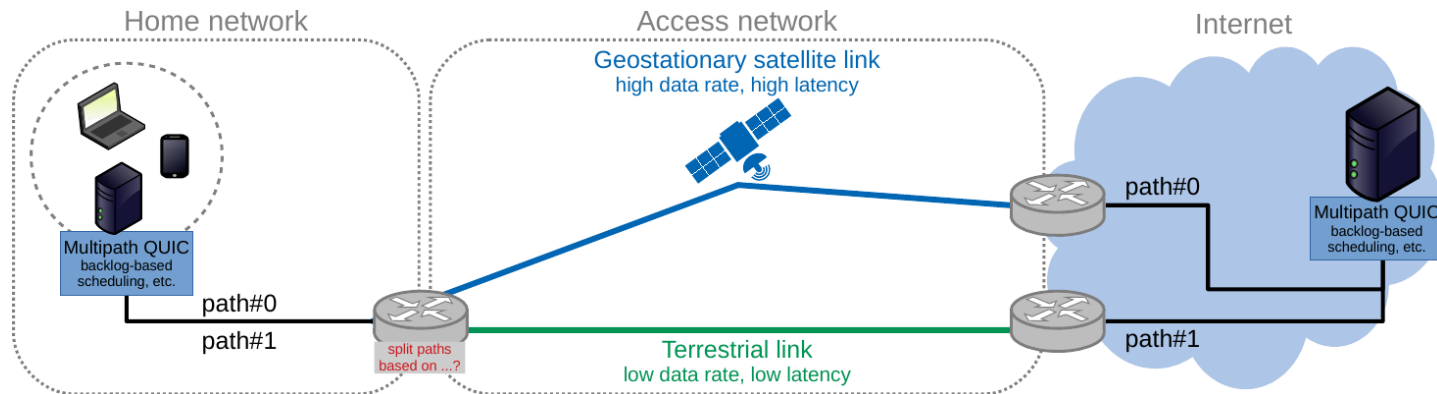
- **Motivation**
  - combine two sub-optimal access links to provide a good one
    - compensate high latency of geostationary satellite links
    - vice versa: boost data rate of slow terrestrial links
  - especially for (rural) areas with poor Internet connectivity

- **Current (TCP) architecture**

- scheduling: switch frequently among heterogeneous links
  - connection setup / requests → terrestrial link; large chunks of data → satellite link; small data → terrestrial link, etc.
  - requires availability and knowledge of both paths at the same time

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- **QUIC → no PEPs → end-to-end multipath → Multipath QUIC**
  - good (single-path) QUIC performance over satellite link?
  - fine-grained scheduling and frequently switching among heterogeneous paths realizable with connection migration?
  - quick (0-RTT) connection setup for both links?
  - implementation and performance tests work in progress
- **Future (Multipath QUIC) architecture without PEPs?**

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- ## **Variety of Internet access links a motivation for multipath?**
  - DOCSIS, DSL, cellular, satellite (LEO, MEO, GEO), ...

- ## **More information**
  [1] Deutschmann J., Hielscher KS.J., German R. (2020)
  An ns-3 Model for Multipath Communication with Terrestrial and Satellite Links
  https://doi.org/10.1007/978-3-030-43024-5_5
  https://www7content.cs.fau.de/~deutschmann/2020_MMB_SatTerMultipath_paper.pdf

  draft-deutschmann-sat-ter-multipath-00

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- **Performance results with current (TCP) architecture**
  - Linux-based prototype implementation (preliminary!)
    Browsertime v10.1.0

Alexa Top 50 DE Websites (20 iterations)