Transport for Satellite
draft-jones-tsvwg-transport-for-satellite-02

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Transport for Satellite - Context

• tcpsat wg produced RFC2488 and RFC2760 - concluded 2000
  • TCP features that require tuning for GEO satellite deployment

• Modern satellite services:
  • Are much faster than 20 years ago!
  • TCP is much more sophisticated than it was 20 years ago!
  • TCP over satellite today is accelerated by PEPs

• However:
  • PEPs are a deployment barrier to new features, e.g. QUIC
  • PEPs are impractical for VPN, etc
  • A range of other satellite systems and orbits: LEO, MEO, Hybrid terrestrial, etc
Transport for Satellite – SATCOM systems

<table>
<thead>
<tr>
<th></th>
<th>Data rate</th>
<th>Latency</th>
<th>Loss</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO</td>
<td>High</td>
<td>Low</td>
<td>Very low</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Low</td>
<td>Congestion losses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High/Variable</td>
<td>High</td>
<td>Very low</td>
<td>Loss if Wi-Fi</td>
</tr>
<tr>
<td>LEO</td>
<td>High</td>
<td>Low</td>
<td>Very low</td>
<td></td>
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<tr>
<td></td>
<td>High</td>
<td>Low</td>
<td>Low/Variable</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Medium/Variable</td>
<td>Low</td>
<td>Very loss</td>
<td>Loss if Wi-Fi</td>
</tr>
</tbody>
</table>

XXX The authors solicit feedback and experience from users and operators of satellite systems in LEO orbits. XXX
Transport for Satellite – being path aware

• Satellite systems:
  • Point-to-point links or TV broadcast
  • Access technology for remote locations
  • Backup and rapid deployment of new services
  • Transit networks
  • Backhaul (various types of IP networks)

➢ Satellite: IP network segment *one part* of the end-to-end Internet path
  • User traffic can experience a path that includes:
    • Satellite network segment (higher delay link, variable delay links, etc.)
    • Path combined with a wide variety of other network technologies
      • Ethernet, cable modems, WiFi, cellular, radio links, etc
Changes from *-00 to *-02

• New terminology section
  • Using I-D.irtf-panrg-path-properties

• A generic SATCOM system could contain the following entities:
  • A: Host providing the end service
  • B: Node being the point-of-presence for the SATCOM
  • C: Node gathering network functions
  • D: Node gathering MAC and PHY functionalities
  • E: Node being one of the satellite
  • F: Node receiving the signal from the satellite
  • G: Host providing the end service

Path properties:
• Protocol Features available
• Transport Protocols available
• Transparency

Path properties:
• Symmetric Path
• Disjointness
• Transparency
• Link Capacity
• Link Usage
• One-Way Delay
• One-Way Delay Variation
• One-Way Packet Loss
Next Steps

• Path awareness helps
  • Using the PANRG path properties terminology helps
  • Awareness of typical characteristics helps Internet Protocol designers
  • Awareness of actual characteristics allows better decisions in future

• More work needed to exploit PANRG terminology in all the document

• Should this document be a research group document?