Highly-Mobile Airborne Network Telemetry Architecture
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Airborne Telemetry Networks

- Telemetry network
  - very high relative velocity
    - Mach 7
    - contact time $\mathcal{O}(10\text{s})$
  - dynamic topology
    - limited spectrum
    - asymmetric links
      - data down; omnidirectional
      - C&C up; narrow beam
    - multihop
      - among TAs
      - relay nodes forward to GS

Protocol Architecture

- Proposed Approach
  - domain specific architecture
  - explicit support for cross layering
    - knobs and dials build in to protocol headers
  - highly adaptive protocols
  - gateways translate to and from legacy protocols

Packet Formats and Mapping

- AeroTP: TCP-friendly transport protocol
  - ports, seq#, timestamp, flags from TCP
  - multiple reliability modes
    - full, nearly, quasi, none (flow), none (datagram)
    - efficient flow setup: data overlaps control
- AeroNP: IP-compatible network protocol
  - IP addresses mapped to MAC and device id
- AeroRP: geolocation-assisted routing protocol
  - information may be obtained through snooping
  - multiple security modes

- AeroNP encapsulating AeroTP
  - fields copied from TCP and IP

03 April 2009