Millimeter-Wave Link Performance under Disruptions
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Millimeter Links
- Millimeter wave (70 – 90 GHz) links
  - point-to-point LOS; range ≤ 5 mi.
  - 5 GHz bw: link rate ≤ 10 Gb/s
  - very susceptible to weather
    - limits practical viability
- Fixed Wireless Mesh Networks
  - use resilience mechanisms to improve reliability
    - path diversity, cross-layered routing
  - requires thorough understanding of link characteristics
  - demands practical evaluation of millimeter-wave links
    - long duration field measurements
    - characterize impact of weather events

Experimenatal Link Deployment
- Two-hop path
  - links with and without FEC
  - five weather stations collect precipitation data
- Year long measurements
  - collect rain, snow, humidity and frame error rate data

Link Performance
- Aggregate frame-level performance
  - characterize impact of precipitation on frame error rate
  - FEC strongly correlates to diurnal humidity cycle
- Impact of FEC
  - RS(204,188) effective against rain rates up to 5 mm/hr
  - FER reaches 100% for strong precipitation events
    - emphasizes need for resilience mechanisms at network layer
- Link availability based on industry requirements
  - overall availability ~ 95% with FEC
  - potential for improvement with resilient routing

Conclusions

Funding for this research provided in part by Sprint
03 April 2009