MANET use cases and Proposed MANET Routing Protocols

Abdussalam Baryun
Department of Mobile Computing
Faculty of Information Technology, University of Tripoli
MANET Use cases

• RFC2501
  – Military requirement
  – Fire/Safety/Rescue Operations or other scenarios requiring
  – "wearable" computing and communications combined with satellite
    based information delivery
  – Efficient dynamic networking
  – MANET routing: Reactive, proactive, and hybrid routing

• New use cases
  – New layer 2 Technologies
  – 5G/6G networks, and IoT
  – Emergency Communication and disaster situations

• Experimental and standard MANET Routing RFCs
  – WG published two proactive and two reactive as experimental (2003-2007)
  – WG published OLSRv2 as standard for proactive routing (2014)
Essential parameters that should be varied while measuring:

1) Network size
2) Network connectivity (i.e. the average number of neighbors of a node)
3) Topological rate of change--the speed with which a network's topology is changing
4) Link capacity--effective link speed measured in bits/second
5) Fraction of unidirectional links
6) Traffic patterns--how effective is a protocol in adapting to non-uniform or bursty traffic patterns?
7) Mobility--when, and under what circumstances, is temporal and spatial topological correlation relevant to the performance of a routing protocol? In these cases, what is the most appropriate model for simulating node mobility in a MANET?
8) Fraction and frequency of sleeping nodes--how does a protocol perform in the presence of sleeping and awakening nodes?
Main Measuring Performance Metric

1) End-to-end delay
2) Packet Delivery Rate
3) Overhead
4) Efficiency
RFC2501

- It should be recognized that a routing protocol tends to be well-suited for particular network contexts, and less well-suited for others. In putting forth a description of a protocol, both its *advantages* and *limitations* should be mentioned so that the appropriate networking context(s) for its usage can be identified.
MANET Routing Proposals

- RFC3561 (AODV) and RFC4728 (DSR)
- AODVv2
- DSRv2 (draft-00 still not submitted)
  - Use of RFC5444 MANET Packet/message format
  - Use of RFC6130 MANET NHDP (optional)
  - Use of DLEP RFC8175 (optional)
- Hybrid Routing
- Multicast Routing