

# Wireless Mobile & Multimedia Networking 7COM1076 Ad-hoc Networks 4

**Dr Tazeen Syed**

**[t.s.syed@herts.ac.uk](mailto:t.s.syed@herts.ac.uk)**

**School of Physics Engineering and Computer Science (SPECS)**

# Outline

- ❑ Destination-Sequenced Distance Vector (DSDV)
- ❑ Dynamic Source Routing (DSR)
- ❑ Performance comparison of DSDV & DSR
- ❑ Ad-hoc On-Demand Distance Vector (AODV)
- ❑ TCP Performance in ad hoc networks
- ❑ Enhancement Approaches

# DSDV Table -Driven Routing protocols

- Table-driven / proactive routing protocol
  - Enhanced version of Bellman-Ford routing protocol
  - Routing information must be updated periodically
- Brute force approach
  - Each node maintains routing information for all known destinations
  - Connectivity information needs periodical update throughout the whole network.
  - Maintains routes which are never used.

# Dynamic Source Vector (DSR) Routing Protocol

- **On-demand / reactive routing protocol**
  - Execute the path-finding process and exchange routing information only when a path is required from a source to a destination.
  - No periodic routing updates or routing information exchange.
- **Source routing**
  - Route discovery is initialized by the source node.
  - The source node determines the complete sequence of nodes to forward a packet.

# Performance Comparison

- Routing set-up delay
  - DSDV – short
  - DSR–long
  - Why?
- Routing overhead
  - DSDV –heavy
  - DSR –not as heavy as DSDV
  - Why?
- Route length
  - DSDV –short
  - DSR –long
  - Why?
- Average end – to -end delay
  - DSDV –low
  - DSR – high
  - Why? Both not suitable for high mobility ad hoc networks

# Ad hoc On-Demand Distance Vector (AODV)

- Ad hoc on-demand distance vector (AODV) routing protocol.
- Target for large ad hoc networks with 10,000 to 100,000 nodes.
- Essentially a combination of DSR and DSDV.
  - Borrow the basic on-demand mechanism of Route Discovery and Route Maintenance from DSR.
  - Use of hop-by-hop routing, sequence numbers, and periodic beacons from DSDV.
- Only active routes are maintained.
- What will you predict its performance?

# TCP Throughput Degradation in Ad-hoc Networks

- Misinterpretation of packet loss
- Frequent path breaks
- Effect of path length
- Uni-directional path
- Network partitioning and remerging

# Enhancement Approaches

- Getting feedback from the network to TCP source.
- Separate congestion control and end-to-end reliability.



# References

- ❑ Ad Hoc Wireless Networks, architectures and protocols.  
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- ❑ J. Broch, D.A.Maltz, B.D.Johnson, Y.Hu and J.Jetcheva. A Performance comparison of multi-hop wireless ad hoc routing protocols. In mobicom'98: Proceedings of the 4<sup>th</sup> annual ACM/IEEE International conference on Mobile Computing and Networking, pages 85-97,1998.

Thank you | Any Questions?



[t.s.syed@herts.ac.uk](mailto:t.s.syed@herts.ac.uk)

