

# A Reverse AODV Routing Protocol in Ad Hoc Mobile Network



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A decorative graphic at the top of the slide consists of two groups of three circles. The first group on the left has a solid light purple circle on the left, a white circle with a light purple outline in the middle, and a white circle with a light purple outline on the right. The second group on the right has a solid light purple circle on the left, a white circle with a light purple outline in the middle, and a solid light purple circle on the right.

# Outline

- Introduction
- R-AODV protocol
- Performance Result
- Conclusion



# Introduction

- Mobile ad hoc network
  - Formed by wireless hosts which may be mobile
  - Rapid change of topology
- Two kinds of protocol
  - Proactive
  - Reactive

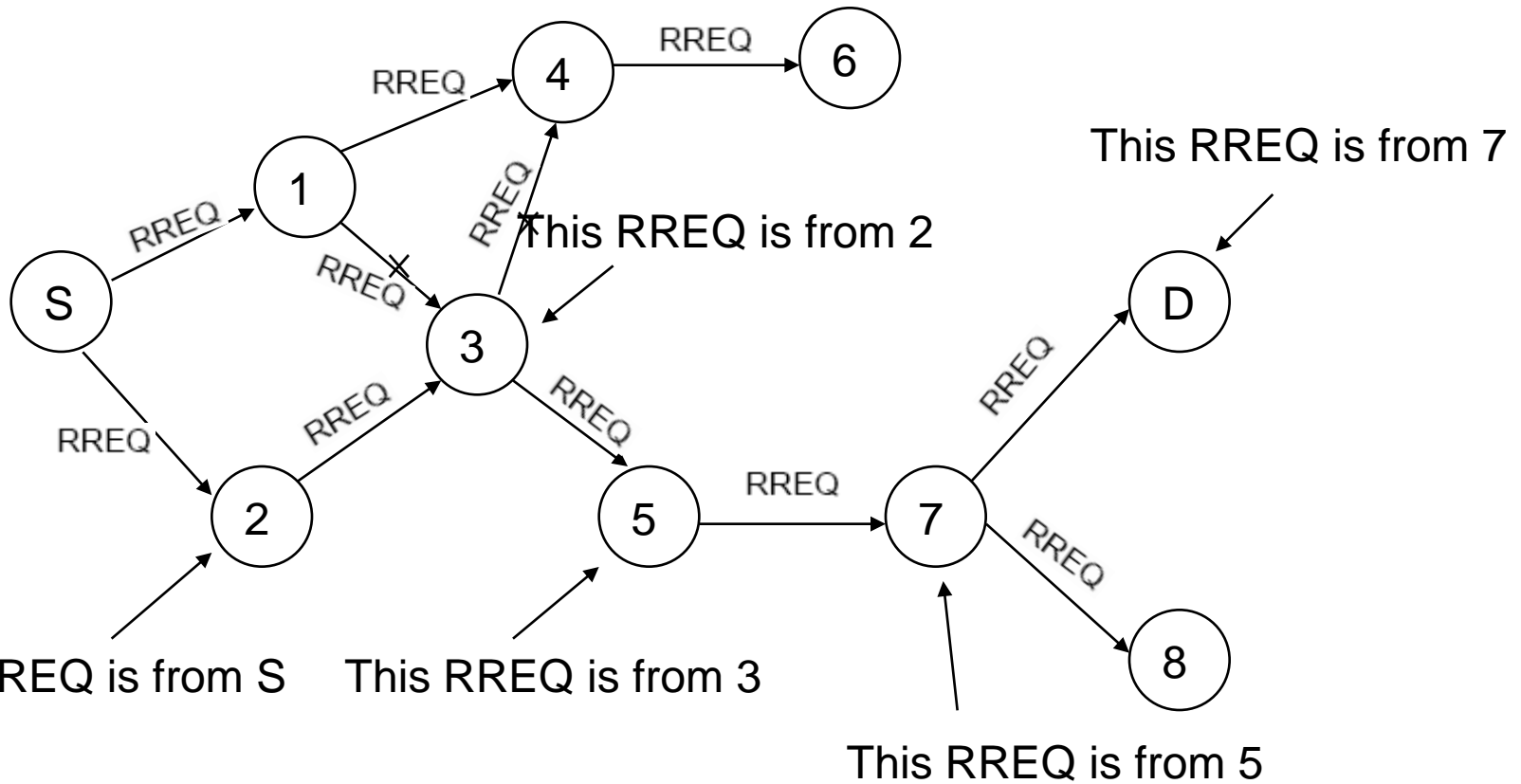
# Introduction

The slide features a decorative header with the word 'Introduction' in a large, black, sans-serif font. Above the text are two overlapping circles: a solid light purple one on the left and an outlined light purple one on the right. To the right of the text, there are three more circles in a row: a solid light purple one, an outlined light purple one, and another solid light purple one.

- A drawback of existing on-demand routing protocols is that the routing are not well concerned about a route reply message loss.
- Most of today's on-demand routing is based on single route reply message.
- In R-AODV, route reply message is not unicast.

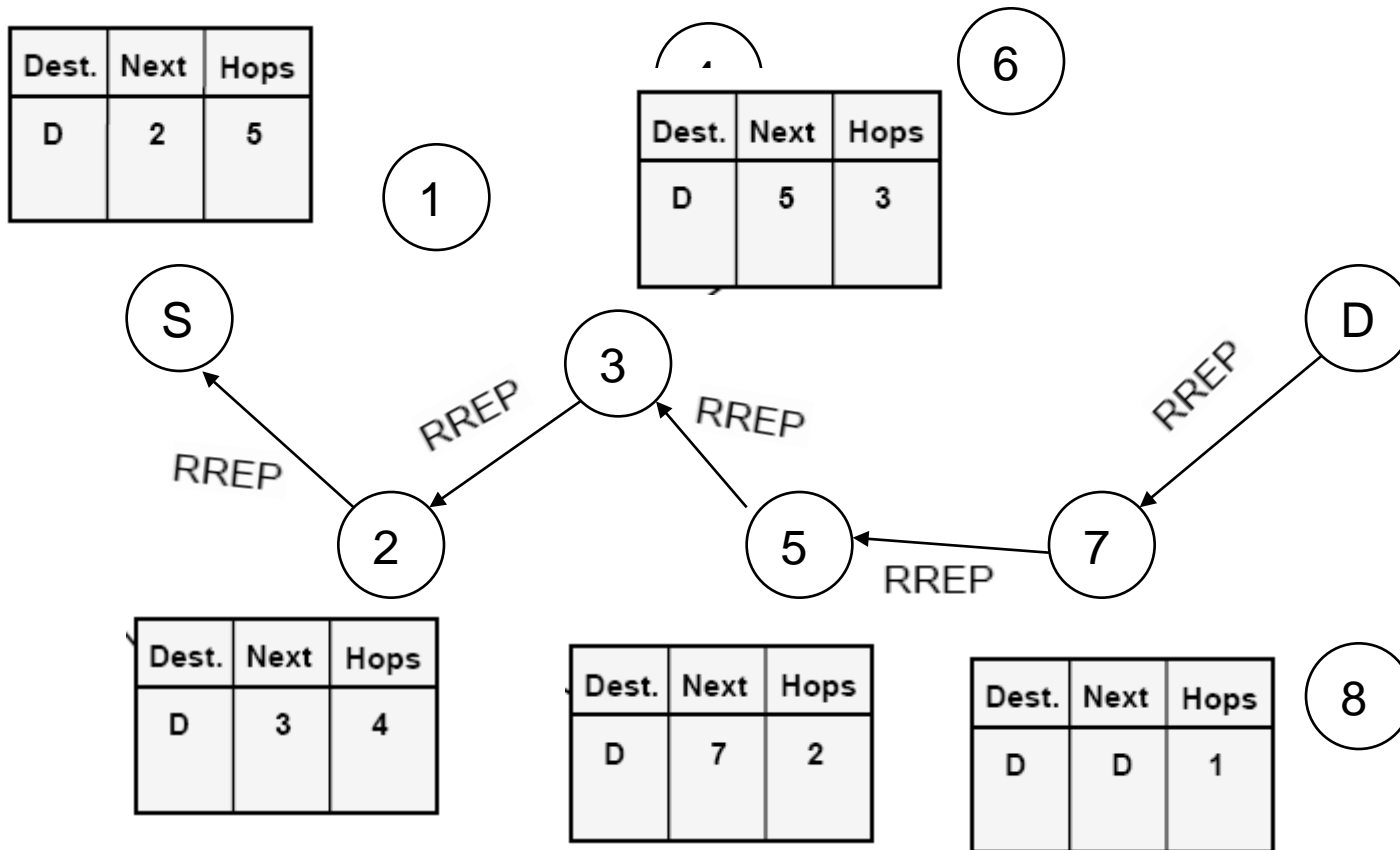
# Introduction(cont.)

- AODV routing protocol



# Introduction(cont.)

- AODV routing protocol



# R-AODV



- R-AODV

- Sending RREQ like AODV

- After receiving RREQ message, destination node floods *reverse request* (R-RREQ), to find source node

- Node stores or updates information of routing table

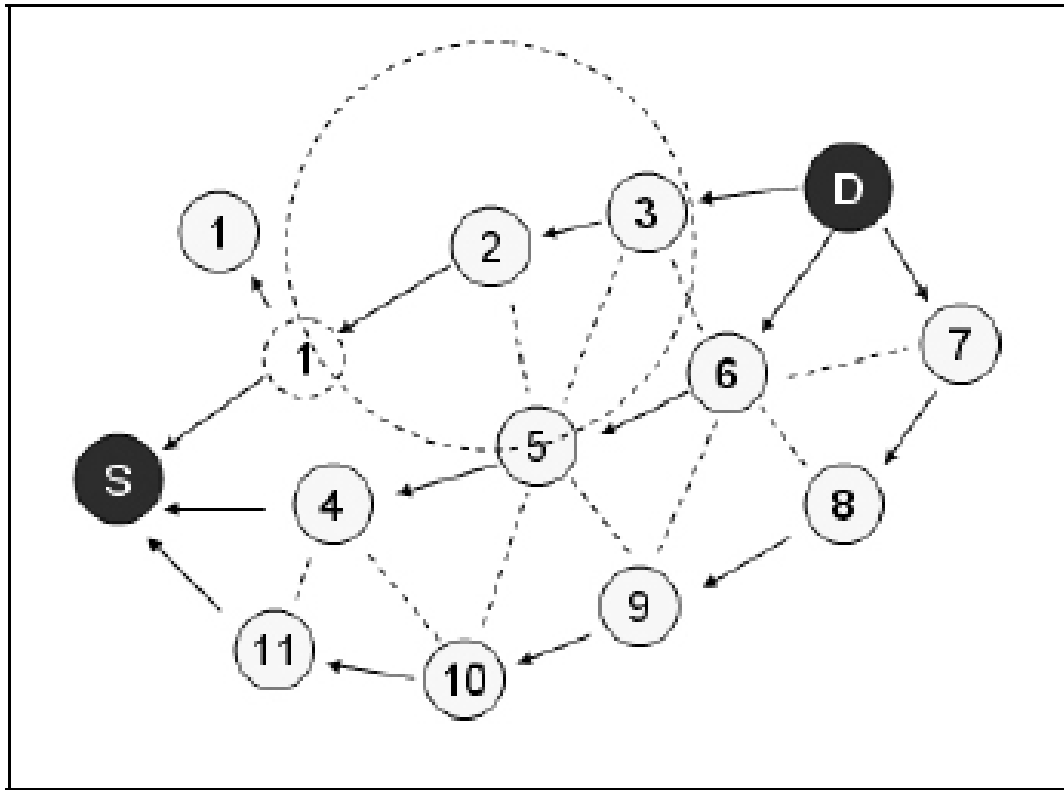
# R-AODV



- Source node receives first R-RREQ message, it starts packet transmission.
- late arrived R-RREQs are saved for future use



# R-AODV



D->3->2->1->S ; D->6->5->4->S ; D->7->8->9->10->11->S

# R-AODV



- Route Maintenance

- The source node can select alternative route or trigger a new route discovery procedure.
- first the node compares sequence numbers, higher sequence numbers mean recent routes.
- second node compares number of hops up to destination
- If fail occurs closer to destination node, RERR received nodes can try local-repair

# R-AODV



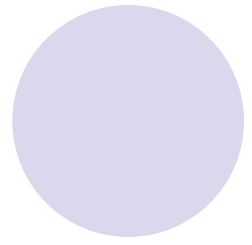
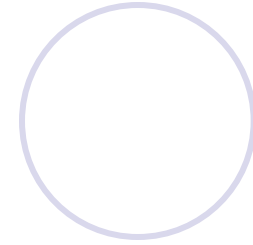
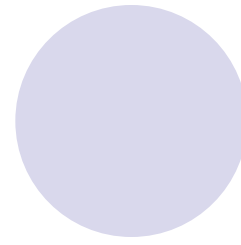
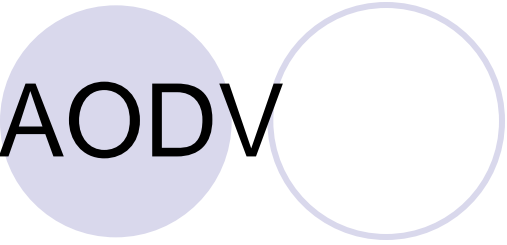
- The RREQ and R-RREQ message contains
  - Source ip address
  - Destination ip address
  - Broadcast id
  - Hop count

# R-AODV



- Routing table contains
  - Destination node address
  - Source node address
  - Hop up to destination
  - Sequence number
  - Route expiration time
  - Next hop to destination

R-AODV



- Control Packet Overhead

$$AODV(m) = (m - 1 + t)$$

$$AODV(m) = c(m - 1 + t)$$

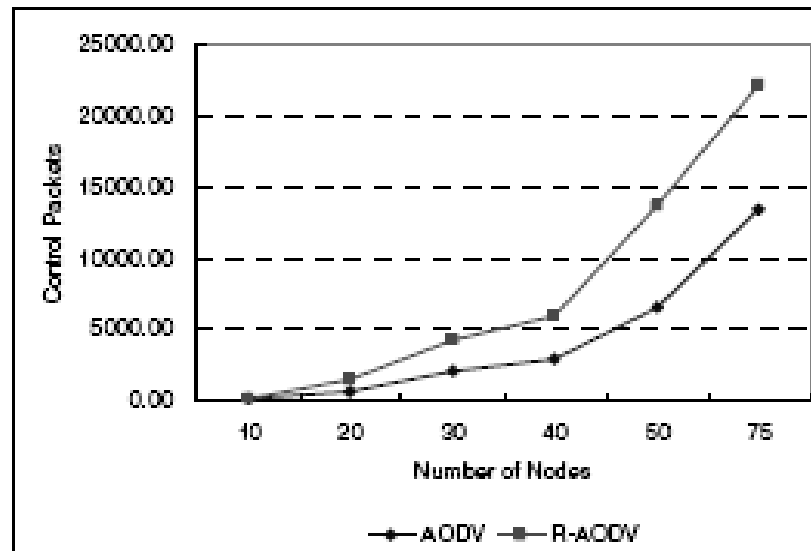
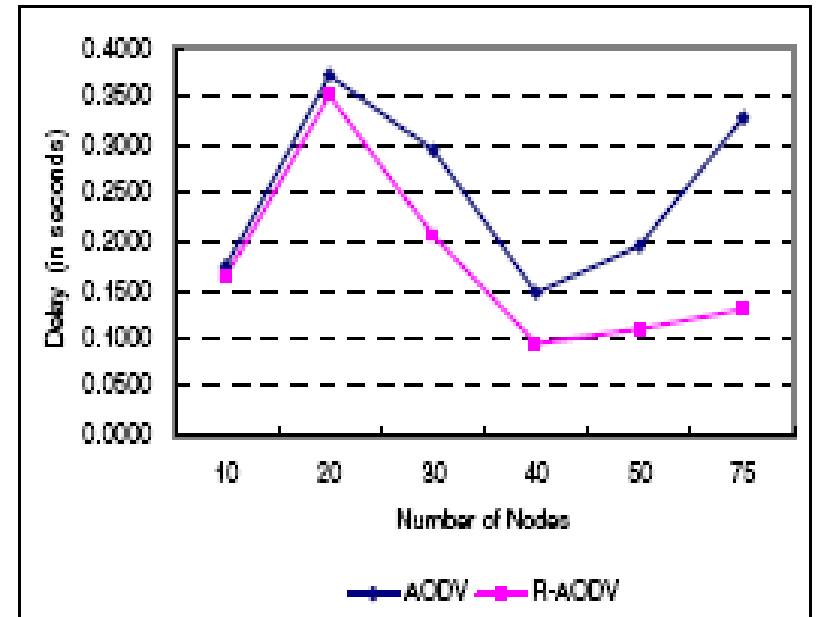
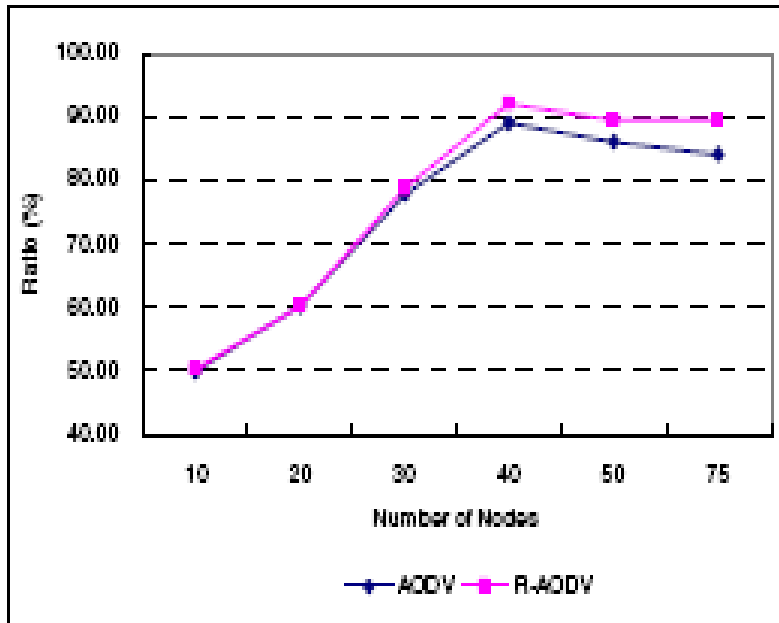
$$RAODV(m) = O(2m - 2)$$

# Performance Result

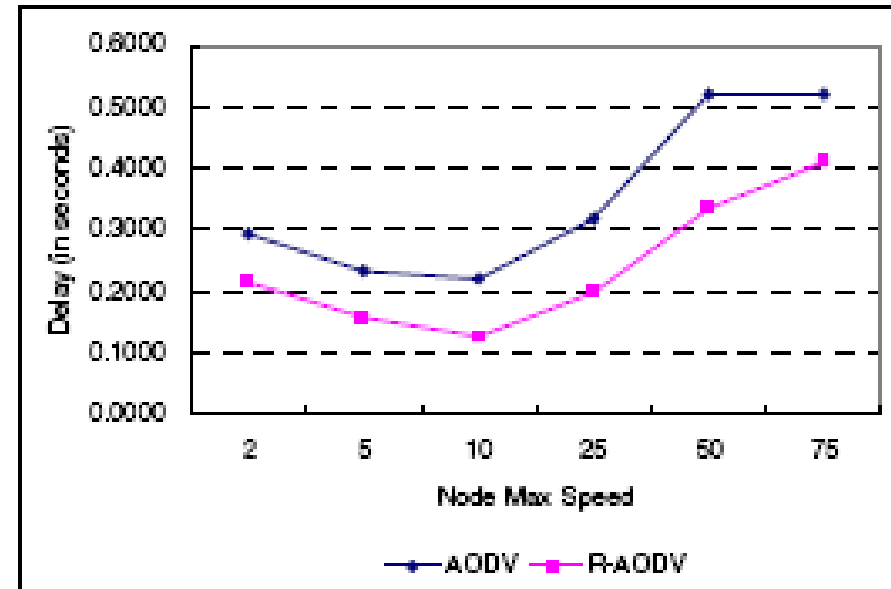
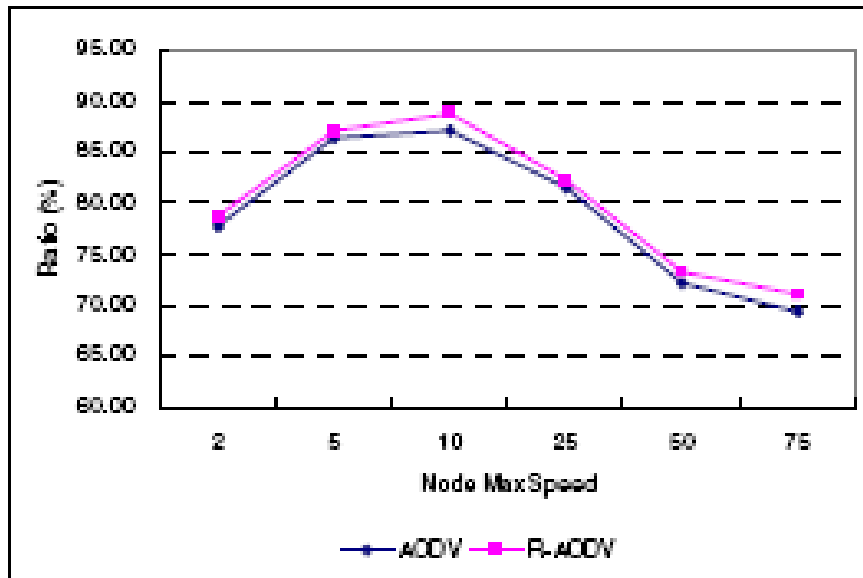
- Setup

- The simulations were implemented on NS2
- Number of nodes: 10, 20, 30, 50, 75
- Area: 1000m\*1000m
- Transmission range: 250m
- Mobile speed: 0~max speed (2, 5, 10, 25, 50, 75m/s)
- Run for 100 s

# Performance Result



# Performance Result







# Conclusions

- Successful delivery of RREP messages are important in on-demand routing protocols for ad hoc networks.
- R-AODV route discovery succeeds in fewer tries than AODV and improves the performance of AODV.