

# Investigation of channel formation in a MANET Kerul Patel, John DeDourek, Przemyslaw Pochec



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### Introduction

• An ad-hoc network is a collection of wireless mobile nodes forming a temporary network without the aid of any stand-alone infrastructure or centralized administration. In an ad-hoc network, the nodes not only act as hosts but also assist in establishing connection by acting as routers that route data packets to/from other nodes in the network

• In a Mobile Ad-hoc Network (MANET), the nodes have a tendency to move and so the topology may change dynamically and unpredictably. Due to this spontaneous and dynamic nature, routing in MANETs is proving to be an interesting and challenging problem for researchers. To overcome the routing problem, various routing protocols have been developed

• We investigate the formation of a channel in a MANET taking into account parameters such as range of a wireless node, area size, number of nodes in the topology, and routing protocol used.

## Simulation Parameters

• Network Simulator 2 (NS-2) is used to investigate the scenario.

• NS-2 supports various MANET routing protocols and enables a user to create and modify the wireless topology, number of nodes and their mobility, data traffic, and various other parameters.

Topology size (A)	1250 x 1250 m
Simulation time	50 sec
Range of wireless node (R)	250 m
Number of nodes (N)	30, 40, 50, 60, 70, 80, 90
Routing protocols used	AODV, DSR

#### 1. Percentage of packets received

The ratio of the number of packets successfully received at the destination to the total number of packets sent from the source. This is the main performance metric as it shows how successfully the connectivity between the two nodes in a network is maintained. 100% packets received indicates that the connectivity was available all the time.



#### 2. Hop count

The number of times a packet was forwarded by wireless nodes before reaching its destination.



#### 3. Set-up delay

The time from when the first packet is sent until the first packet reaches its destination i.e. time taken to form a channel for the first time.

### **Performance Metrics**

• We introduce a parameter *normalized node density* per unit area. The unit area is defined as the area covered by the transmission range of a wireless node. The normalized node density can be calculated using the formula R\*N/A.

