

# Implementation of DSR on Manet using NS2

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**Abstract** Routing is a process of exchanging information from one station to other stations of the network. Routing protocols of mobile ad-hoc network tend to need different approaches from existing Internet protocols because of dynamic topology, mobile host, distributed environment, less bandwidth, less battery power.

**Index Terms**- ns2,DSR,Wireless sensor,ycl,c++

## INTRODUCTION

AdHoc network is a collection of wireless mobile hosts forming a temporary network without the aid of any centralized administration, in which individual nodes cooperate by forwarding packets to each other to allow nodes to communicate beyond direct wireless transmission range.

Routing is a process of exchanging information from one station to other stations of the network. Routing protocols of mobile ad-hoc network tend to need different approaches from existing Internet protocols because of dynamic topology, mobile host, distributed environment, less bandwidth, less battery power.

Ad Hoc routing protocols can be divided into two categories: table-driven (proactive schemes) and on-demand routing (reactive scheme) based on when and how the routes are discovered. In Table-driven routing protocols each node maintains one or more tables containing routing information about nodes in the network whereas in on-demand routing the routes are created as and when required. Some of the table driven routing protocols are Destination Sequenced Distance Vector Routing protocols (DSDV), Cluster head Gateway Switching Routing Protocol (CGSR), Hierarchical State Routing (HSR), and Wireless Routing Protocol (WRP) etc. The on-demand routing protocols are Ad Hoc On-Demand Distance Vector Routing (AODV), Dynamic Source Routing (DSR), and Temporally Ordered Routing Algorithm (TORA). There are many others routing protocols available. Zone Routing Protocol (ZRP) is the hybrid routing protocol.

Dynamic Source Routing (DSR) protocol, which is used for efficient routing under different scenarios in Mobile Ad-hoc Network (MANET),

which plays a critical role in places where wired network are neither available nor economical to deploy. My objective was to implement the routing protocol using Network Simulator and run it for different number of nodes.

The DSR Dynamic Source Routing protocol which is area of research is used, for its feature that is fast updating topologies. The MANET is one of the widely used networks for communication where there are the movement or mobile sources. The sources itself act as router independently and forms a connection to all available devices in its range. In case of natural calamity like earthquake, flood, cyclone infrastructure based communication is bound to suffer disturbance or lack of operability. Rescue or relief teams generally have to be well equipped with expensive equipments to enable communication between individuals. Introduction of ad-hoc network based voice communication can serve well in this purpose. Also people suffering such disaster can have a way to communicate with each other and the rescue team. Since this network doesn't require any predefined setup or any non-regular device, connectivity is instant and useful. Like any other infrastructure less network, ad-hoc network suffers from lot of complexities due to its dynamic nature and it fails to provide the reliability of a structured network.

There are lots of things to be done in this field. The primary goal of this research work is to go in deep of this field and to make ad-hoc voice communication as close as possible to voice communication systems available to general users in terms of both performance and usability. A wireless ad-hoc network is a collection of mobile/semi-mobile nodes with no pre-established infrastructure, forming a temporary network. Each of the nodes has a wireless interface and communicates with each other over either radio or infrared. Laptop computers and personal

digital assistants that communicate directly with each other are some examples of nodes in an ad-hoc network. Nodes in the ad-hoc network are often mobile, but can also consist of stationary nodes, such as access points to the Internet. Semi mobile nodes can be used to deploy relay points in areas where relay points might be needed temporarily. The outermost nodes are not within transmitter range of each other. However the middle node can be used to forward packets between the outermost nodes. The middle node is acting as a router and the three nodes have formed an ad-hoc network. An ad-hoc network uses no centralized administration. This is to be sure that the network won't collapse just because one of the mobile nodes moves out of transmitter range of the others. Nodes should be able to enter/leave the network as they wish. Because of the limited transmitter range of the nodes, multiple hops may be needed to reach other nodes.

**DSR (Dynamic Source Routing) Protocol** The Dynamic Source Routing protocol (DSR) is a simple and efficient routing protocol designed specifically for use in multi-hop wireless ad hoc networks of mobile nodes. Using DSR, the network is completely self-organizing and self-configuring, requiring no existing network infrastructure or administration. Network nodes (computers) cooperate to forward packets for each other to allow communication over multiple "hops" between nodes not directly within wireless transmission range of one another. As nodes in the network move about or join or leave the network, and as wireless transmission conditions such as sources of interference change, all routing is automatically determined and maintained by the DSR routing protocol. Since the number or sequence of intermediate hops needed to reach any destination may change at any time, the resulting network topology may be quite rich and rapidly changing. The DSR protocol allows nodes to dynamically discover a source route across multiple network hops to any destination in the ad hoc network. Each data packet sent then carries in its header the complete, ordered list of nodes through which the packet must pass, allowing packet routing to be trivially loop-free and avoiding the need for up-to-date routing information in the intermediate nodes through which the packet is forwarded. By including this source route in the header of each data packet, other nodes forwarding or overhearing any of these packets may also easily cache this routing information for future use.

## Literature Review

**Jae-Hwan Chang et al:** Author develop the routing problem as a linear programming issue, where the aim is to increase the network lifetime, which is identical to the time until the network partition anticipated to battery outage. Two distinct models are examined for the information-production processes. One supposed persistent rates and the other presume an arbitrary process. A shortest cost path routing algorithm is present which uses link costs that reflect both the communication energy consumption rates and the residual energy levels at the two end nodes. The algorithm is flexible to distributed implementation. Simulation outcome with both information-generation process models show that the presented algorithm can attain network life time that is very close to the optimal network lifetime gained by solving the linear programming issues.

**JAMAL N. AL-KARAKI et al:**In this paper they present a survey of state-of-the-art routing methods in WSNs. They first demonstrates the

design limitation for routing protocols in WSNs followed by a inclusive survey of routing methods . Overall, the routing methods are categorized into three categories on the basis of underlying network structure: flat, hierarchical, and location-based routing. Moreover, these protocols can be categorized into multipath-based, query-based, negotiation-based, QoS-based, and coherent based pending on the protocol operation. They also study the design trade-offs among energy and communication overhead savings in every routing pattern. They also highlight the benefits and presentation issues of each routing methods. The paper concludes with available future research areas.

**Chris Karlof and David Wagner:** They examine routing security in wireless sensor networks. Many sensor network routing protocols have been suggested, but none of them have been designed with security as an objective. They recommend security aims for routing in sensor networks, show how attacks against ad-hoc and peer-to-peer networks can be adapted into powerful attacks against sensor networks, suggest two classes of novel attacks against sensor networks—sinkholes and HELLO floods, and investigate the security of all the major sensor network routing protocols. They explains crippling attacks against all of them and demonstrates countermeasures and design considerations. This is the first such investigation of protective routing in sensor networks.

**Kemal Akkaya and Mohamed Younis:** This paper presents recent advances in wireless sensor networks have show to many new protocols particularly designed for sensor networks where energy awareness is an mandatory analysis. Most of the attention, however, has been given to the routing protocols since they might distinct depending on the application and network architecture. This paper surveys recent routing protocols for sensor networks and presents a classification for the distinct approaches chased. The three main classification traverse in this paper are data-centric, hierarchical and location-based. Each routing protocol is suggested and explained under the suitable category. Furthermore, protocols using contemporary techniques alike network flow and quality of service modeling are also illustrated The paper ended up with open research problems.

**I.F. Akyildiz et al.:** The main aim of is to make a comprehensive survey of design issues and techniques for sensor networks describing the physical constraints on sensor nodes and the protocols proposed in all layers of network stack. Possible applications of sensor networks are also discussed. That survey is a good introductory for readers interested in the broad area. Although a number of routing protocols for sensor networks are covered, the paper does not make a classification for such routing protocols and the list of discussed protocols is not meant to be complete given the scope of the survey. Our survey is more focused and can serve those who like deeper insight for routing issues and techniques in wireless sensor networks. To the best of our knowledge, our paper is the first work to make a classification of routing protocols in sensor networks. Moreover, our work reflects the current state of art in routing research by including a comprehensive list of recently proposed routing protocols.

## Project Scope

This document includes details covering the design of all the MANET networks using DSR protocol software components currently known to project developers. This includes but is not limited to:

- Simulation interface design engineering.
- Detailed description of objects and classes to be used.

• Usability. Implementation of DSR protocol over MANET using NS2 will provide researchers detail references of challenges and usability at real time environment.

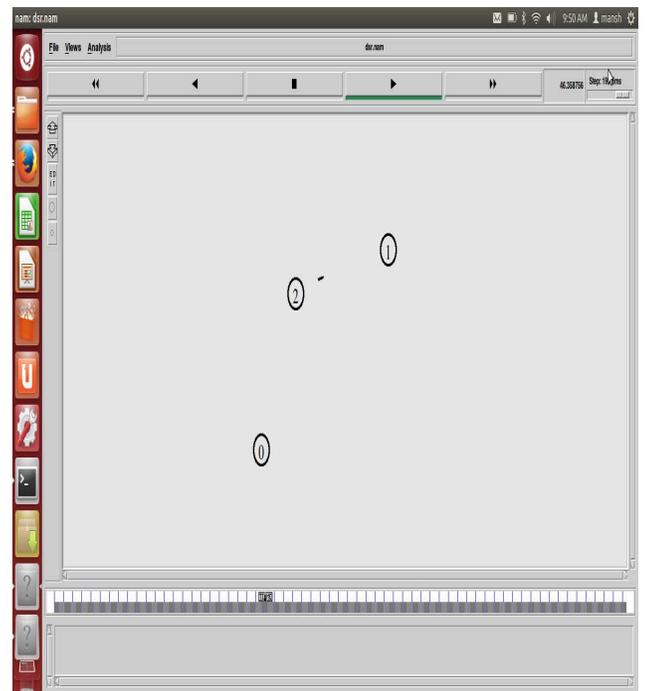
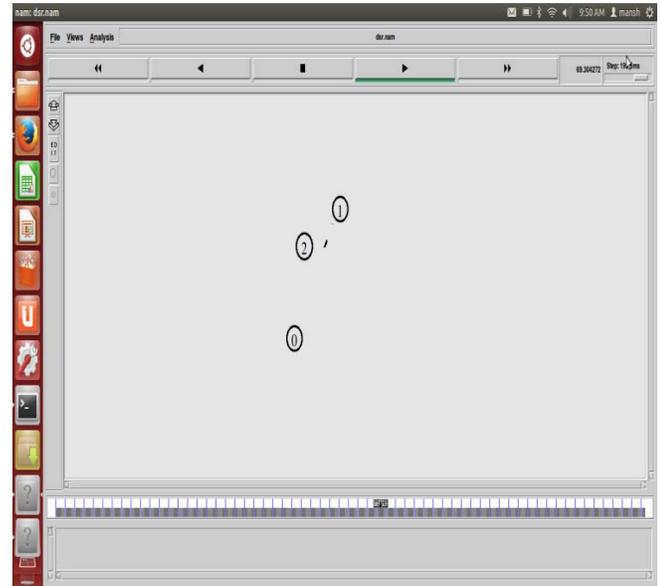
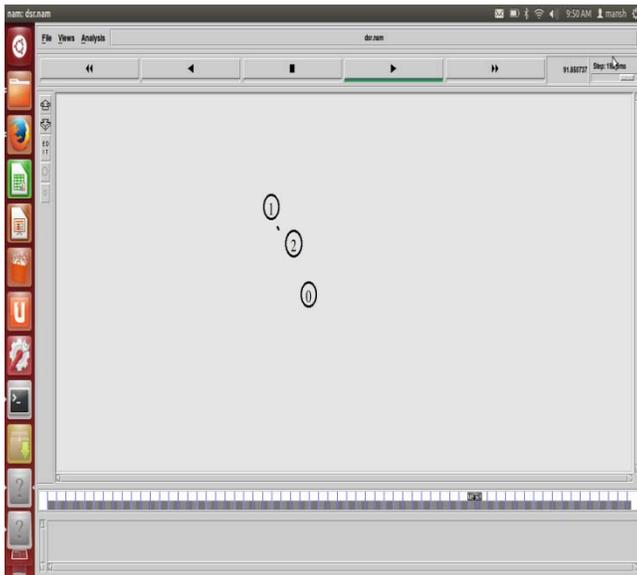
### **Project Features**

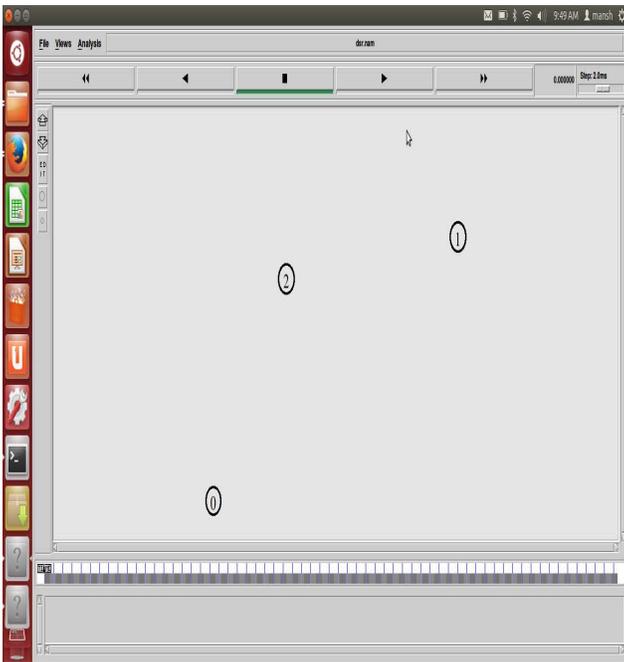
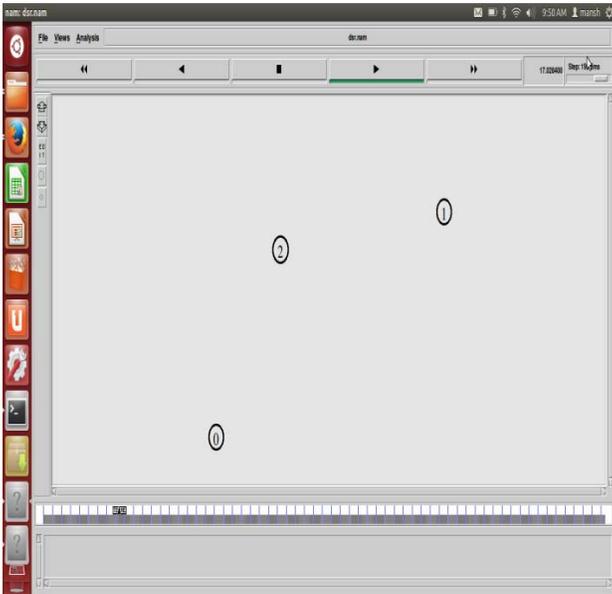
The project features user to use any devices with basic hardware that supports MANET and works wireless. The simulation performs not only for user soldier but any other user vehicle that it's flexible with the changes of speed or moving rate. The communication is limited to voice and can be changed for other relations also. It's a real time scenario for a military operation. The DSR protocol is a proactive protocol used to update automatically with limited cache and size. It's adaptable to fast changes in topology and use of more efficient way of route maintenance.

### **Some features of Project:**

- Generates a visual simulation with graph analysis.
- DSR protocol used which perform faster route maintenance.
- CBR Constant Bit Rate with voice channel support.

### **Screen Shots**





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