

## Empirical Study on Mobile Ad hoc Network

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**Abstract:** *An ad-hoc network is temporarily formed by a group of mobile hosts communicating over wireless channels without any fixed network interaction and centralized administration. When a mobile host communicates with other mobile hosts in an ad-hoc network, the routes are established via the intermediate mobile hosts as forwarding nodes. In this paper we discuss about rule and methodology used and under such a network environment routing management.*

**Keywords:** *MANET, AODV, DSR*

### I. Introduction

A mobile ad hoc network consist of a collection of wireless mobile nodes that are capable of communicating with each other without the use of network infrastructure or any centralized administration. We can also say that a **wireless ad hoc network** is a decentralized type of wireless network [1][2]. The network is ad hoc because it does not rely on a pre existing infrastructure, such as routers in wired networks or access points in managed (infrastructure) wireless networks. Instead, each node participates in routing by forwarding data for other nodes, so the determination of which nodes forward data is made dynamically on the basis of network connectivity. In addition to the classic routing, ad hoc networks can use flooding for forwarding data.

### II. MOBILE AD-HOC NETWORKING PROTOCOLS

The main problem with Ad Hoc networking is how to send a message from one node to another with no direct link. The nodes in the network are moving around unpredictably and it is very challenging, which nodes that are directly linked together. The topology of an Ad Hoc network is constantly changing and it is very difficult for routing process. There are 2 main approaches for routing process in Ad Hoc networks. The 1st approach is a pro-active approach, which is table driven and uses periodic protocols. This means that all nodes have tables with routing information, which are updated at intervals. The second approach is re-active, source-initiated or on-demand. This means that every time a message is sent it first has to find a path by searching the entire network. There are many different protocols that are in accordance with the 2 different routing approaches. Different protocols are specialized in different aspects of the routing. Other aspects than finding a short path are low overhead communication and load-balancing.

The AODV and DSR are source-initiated or on-demand routing protocols (Haas, 1997). The 2 Ad Hoc routing protocols considered in this study.

**Ad Hoc on demand distance vector routing-AODV:** The Ad Hoc On-demand Distance Vector routing protocol [3,4,5] enables multihop routing between the participating mobile nodes wishing to establish and maintain an Ad Hoc network. AODV is a reactive protocol based upon the distance vector algorithm.

The algorithm uses different messages to discover and maintain links. Whenever a node wants to try and find a route to another node it broadcasts a Route Request (RREQ) to all it's neighbors. The RREQ propagates through the network until it reaches the destination or the node with a fresh enough route to the destination. Then the route is made available by uncasing a RREP back to the source.

The algorithm uses hello messages (a special RREP) that are broadcasted periodically to the immediate neighbors. These hello messages are local advertisements for the continued presence of the node and neighbors using routes through the broadcasting node will continue to mark the routes as valid. If hello messages stop coming from a particular node, the neighbor can assume that the node has moved away and mark that link to the node as broken and notify the affected set of nodes by sending a link failure notification (a special RREP) to that set of nodes.

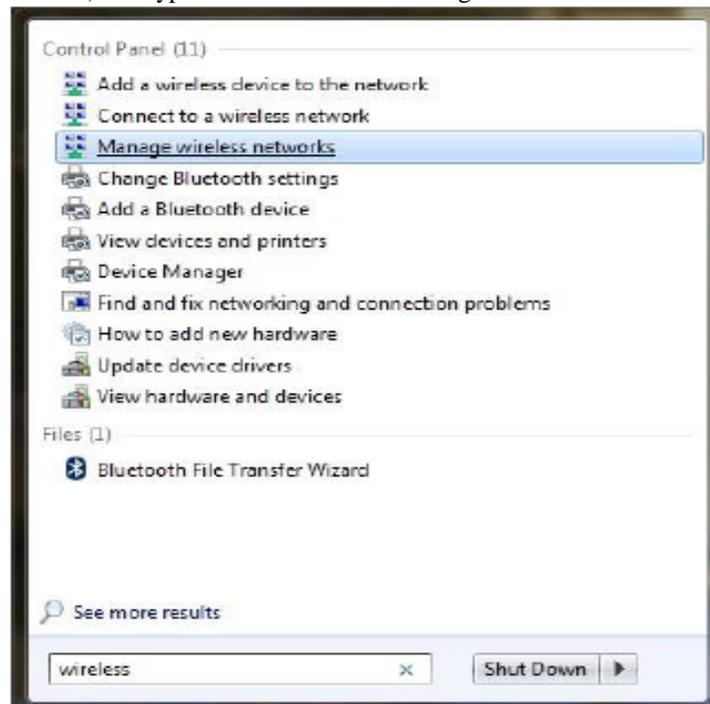
**Dynamic Source Routing-DSR:** Dynamic Source Routing (DSR) [6] belongs to the class of reactive protocols and allows to dynamically discover a route across multiple network hops to any destination. Source routing means that each packet in its header carries the complete ordered list of nodes through, which the packet must pass. DSR uses no periodic routing of messages, there by reducing network bandwidth overhead, conserving battery power and avoiding large routing updates throughout the Ad Hoc network. Instead DSR relies on support from the MAC layer.

Table 1: Unicast routing protocols reviewed in this report[7]

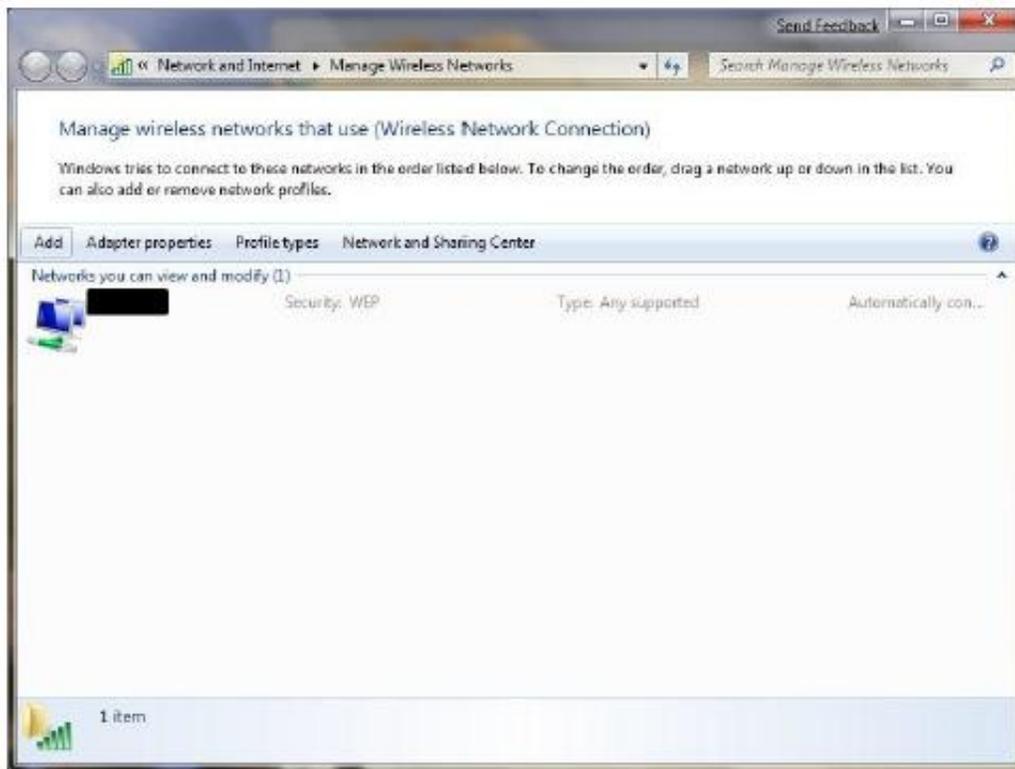
Uniform routing	Proactive routing	Wireless Routing Protocol (WRP)	
		Destination Sequence Distance Vector (DSDV) Routing protocol	
		Fisheye State Routing (FSR)	
		Distance Routing Effect Algorithm for Mobility (DREAM)	Location-based routing.
		Dynamic Source Routing (DSR) protocol	
	Reactive routing	Temporally Ordered Routing Algorithm (TORA)	
		Ad hoc On-demand Distance Vector Routing (AODV) protocol	
		Location Aided Routing (LAR)	Location-based routing.
		Associativity Based Routing (ABR) protocol	Link-stability based routing protocol.
		Signal Stability-base adaptive Routing protocol (SSR)	Link-stability based routing protocol.
Non-uniform routing	Zone-based routing	Zone Routing Protocol (ZRP)	Hybrid routing protocol.
		Hybrid Ad hoc Routing Protocol (HARP)	Hybrid routing protocol also.
		Zone-based Hierarchical Link State routing (ZHLS)	Hybrid routing protocol also.
		Grid Location Service (GLS)	Location service.
	Cluster-based routing	Clusterhead Gateway Switch Routing (CGSR)	
		Hierarchical State Routing (HSR)	
		Cluster Based Routing Protocol (CBRP)	
	Core-node based routing	Landmark Ad hoc Routing (LANMAR)	Proactive routing
		Core-Extraction Distributed Ad hoc Routing (CEDAR)	Reactive routing
		Optimized Link State Routing protocol (OLSR)	Proactive routing

### III. How to create an Ad hoc Network – Windows

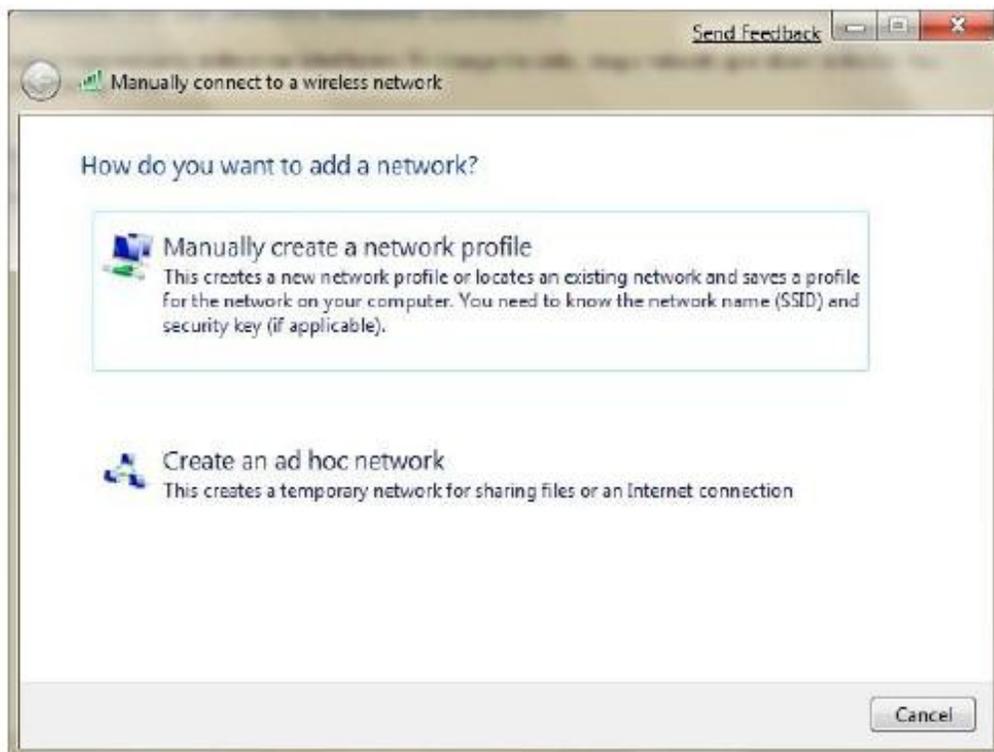
1. Click on Start (Windows icon) and type wireless. Click on Manage wireless networks.



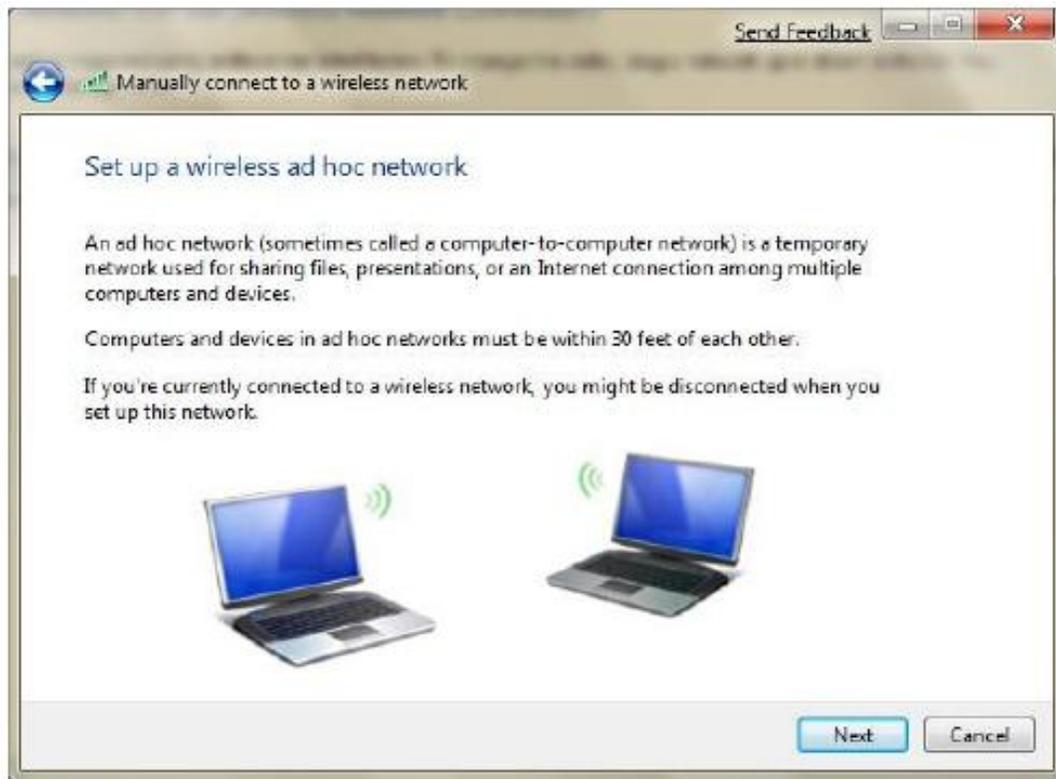
2. Click on **Add** to add a network.



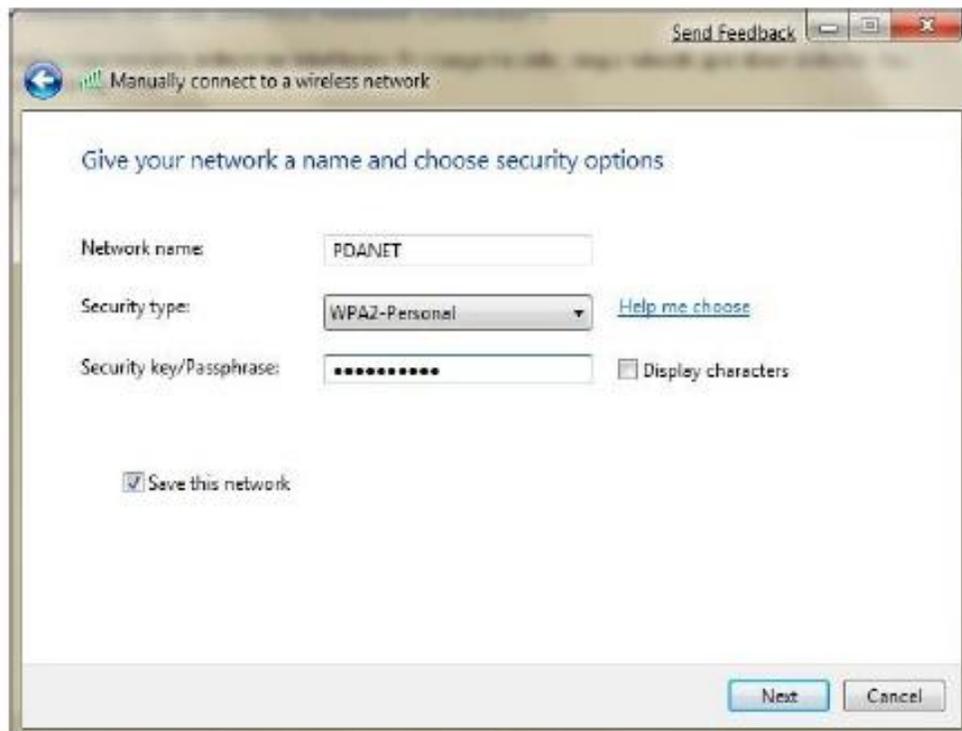
3. Click on **Create an ad hoc network**.



4. Click on Next.



5. Enter a name for your network and configure the security options. Click on Next when you are done.



#### IV. Advantage and Disadvantage of MANET

##### Advantages

- Independence from central network administration
- Self-configuring, nodes are also routers
- Self-healing through continuous re-configuration
- Scalable: accommodates the addition of more nodes
- Flexible: similar to being able to access the Internet from many different locations

##### Disadvantages

- Each node must have full performance
- Throughput is affected by system loading
- Reliability requires a sufficient number of available nodes.
- Sparse networks can have problems
- Large networks can have excessive latency (high delay), which affects some applications.

#### V. Conclusion

Routing is an essential component of communication protocols in mobile ad hoc networks. The design of the protocols are driven by specific goals and requirements based on respective assumptions about the network properties or application area. The survey tries to review typical routing protocols and reveal the characteristics and advantage and disadvantage of MANET.

##### Reference

1. Chai Keong Toh Ad Hoc Mobile Wireless Networks, Prentice Hall Publishers , 2002.
2. **Jump up** C. Siva Ram Murthy and B. S. Manoj, Ad hoc Wireless Networks: Architectures and Protocols, Prentice Hall PTR, May 2004
3. Amir, R., C.E. Perkins and E.M. Royer, 2002. An Implementation study of the AODV routing protocol. Proceedings of the IEEE Wireless Communication and Networking Conference, (WCNC'02), Tel Aviv, Isrel, pp: 3-12.
4. P. Charles and E. Royer, 1999. Ad hoc on-demand distance vector routing. Proceedings of the 2nd IEEE Workshop on Mobile Computing Systems and Applications, February 25-26, 1999, New Orleans, LA., USA., pp: 90-100.
5. Samir, R.D., C. Robert, Y. Jingatao and S. Rimili, 1998. Comparative performance evaluation of routing protocols for mobile ad-hoc networks. Proceedings of the International Confnational Computer Communication and Networks, Oct. 12-15, Lafayette, LA, USA., pp: 153-161
6. Jochen, S., 2000. Mobile Communications. Addison Wesley Longman Pvt. Ltd., India.
7. Changling Liu, Jörg Kaiser, 2005. A Survey of Mobile Ad Hoc network Routing Protocols, :University of Ulm Tech.Report Series, pp: 1-34.