

A Project Report

On

CodeGrader

submitted for partial fulfillment of the requirements for the award of the

degree of Bachelor of Technology in

Computer Science and Engineering

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DECLARATION

We hereby declare that this submission is our own work and that, to the best of our knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

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CERTIFICATE

This is to certify that Project Report entitled “CodeGrader” which is submitted by Saumya Singh, Palak Agarwal, Prachi Singh in partial fulfillment of the requirement for the award of degree B. Tech. in Department of Computer Science & Engineering of Dr. A. P.J. Abdul Kalam Technical University, Lucknow is a record of the candidates own work carried out by them under my supervision. The matter embodied in this report is original and has not been submitted for the award of any other degree.

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ABSTRACT

Codegrader is an online judge which takes your code, compiles it, checks for compilation errors, execute your code by giving some hidden inputs and collecting the output your code gave, checks for runtime errors and finally matches your output with their hidden test outputs. Hidden inputs will be stored in hard disk and will be used at the time of checking program for compilation and execution. Similarly hidden outputs for matching final result of program is also stored in hard disk. User can submit program in any of programming languages and grader will compile and execute code according to defined language. It also handles malicious programs so that any candidate cannot hack the grader system. We are also providing timer to calculate the total time taken by user to submit code for all the questions so that we can compare the performances of each user and give the report correctly. The technology used are JAVA EE, HTML, CSS for developing site and PYTHON for developing grader. Students can conduct their own coding contest through LAN connectivity even without net connection. Teachers can also use this grader for evaluation of the code submitted by students automatically.

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LIST OF ABBREVIATIONS

NAM	Network Animator	
MANET	Mobile Ad-hoc Network	
DSDV	Destination Sequence Distance Vector	
DSR	Dynamic Sequence Resource	
AODV	Ad-hoc On-Demand Vector	
OSI	Open System Interconnections	
TCP/IP	Transmission Control Protocol/Internet Protocol	
Pdf	Packet Drop Fraction	GSR
Global State Routing		

CHAPTER 1 INTRODUCTION

1.1 INTRODUCTION

Wireless cellular systems have been in use since 1980s. We have seen their evolutions to first, second and third generation's wireless systems. Wireless systems operate with the aid of a centralized supporting structure such as an access point. These access points assist the wireless users to keep connected with the wireless system, when they roam from one place to the other.

The presence of a fixed supporting structure limits the adaptability of wireless systems. In other words, the technology cannot work effectively in places where there is no fixed infrastructure. Future generation wireless systems will require easy and quick deployment of wireless networks. This quick network deployment is not possible with the existing structure of current wireless systems.

Recent advancements such as Bluetooth introduced a new type of wireless systems known as mobile ad-hoc networks. Mobile ad-hoc networks or "short live" networks operate in the absence of fixed infrastructure. They offer quick and easy network deployment in situations where it is not possible otherwise. Ad-hoc is a Latin word, which means "for this or for this only." Mobile ad-hoc network is an autonomous system of mobile nodes connected by wireless links; each node operates as an end system and a router for all other nodes in the network.

Nodes in mobile ad-hoc network are free to move and organize themselves in an arbitrary fashion. Each user is free to roam about while communication with others. The path between each pair of the users may have multiple links and the radio between them can be heterogeneous. This allows an association of various links to be a part of the same network. [3]

A mobile ad-hoc network is a collection of mobile nodes forming an ad-hoc network without the assistance of any centralized structures. These networks introduced a new art of network

establishment and can be well suited for an environment where either the infrastructure is lost or where deploy an infrastructure is not very cost effective.

The popular IEEE 802.11 "WI-FI" protocol is capable of providing ad-hoc network facilities at low level, when no access point is available. However in this case, the nodes are limited to send and receive information but do not route anything across the network. Mobile ad-hoc networks can operate in a standalone fashion or could possibly be connected to a larger network such as the Internet [3].

Mobile ad-hoc networks can turn the dream of getting connected "anywhere and at any time" into reality. Typical application examples include a disaster recovery or a military operation. Not bound to specific situations, these networks may equally show better performance in other places. As an example, we can imagine a group of peoples with laptops, in a business meeting at a place where no network services is present. They can easily network their machines by forming an ad-hoc network. This is one of the many examples where these networks may possibly be used.

Wireless networks can be classified as follows-

1. **Infrastructure Networks:** This mode bridges a wireless network to a wired Ethernet network. A wireless access point is required for infrastructure mode wireless networking, which serves as the central WLAN communication station to which the mobile clients attach. The mobile client can move geographically out of range of one base station to the range of another while it is communicating. When it goes, it connects with new base station and starts communicating through it. This results in handoff.
2. **Ad Hoc (Infrastructure less) Networks:** This mode is a method for wireless devices to directly communicate with each other. Operating in ad-hoc mode allows wireless devices within range of each other to discover and communicate in peer-to-peer fashion without involving central access points. This is typically used by two PCs to connect to one another as well as for

wireless mesh networks. Ad hoc routing presents challenges due to high mobility and lack of topology information at each client. We have two categories of ad hoc routing-

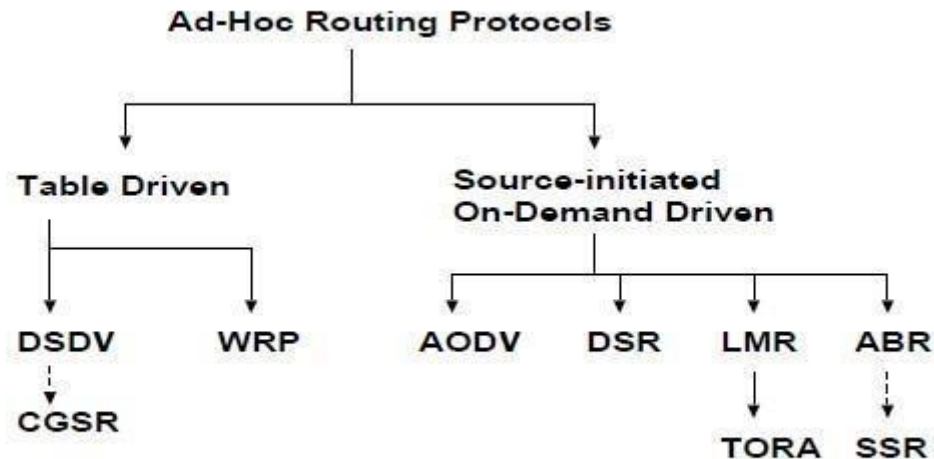


Figure 1.1: Categorization of routing protocol

1. Pro-active (Table-driven) Protocols These algorithms maintain fresh list of destinations and their routes at each node. Eg. Destination- Sequenced Distance-Vector (DSDV).
2. Reactive (On-demand) Protocols. These protocol find a route when needed. Eg. Dynamic Source Routing (DSR), Ad Hoc On-Demand Distance Vector Routing (AODV), Temporally Ordered Routing Algorithm (TORA).

1.2 PROJECT DESCRIPTION

The ad hoc routing protocols DSDV and AODV are two of the promising routing protocols. They can be used in mobile ad hoc networks to rout packets between mobile nodes. The main objectives of this thesis project are:

- (1) Implementing the existing DSDV and AODV routing protocols in ns2.
- (2) Comparing the performance of two protocols under following metrics.
 - (i) Packet delivery ratio
 - (ii) End-to-end delay
 - (iii) Jitter
 - (iv) Drop
 - (v) Throughput
 - (vi) Packet Delivery Fraction
 - (vii) Routing overhead
 - (viii) Routing Overload

CHAPTER 2

LITERATURE REVIEW

2.1 MANETS

Mobile Ad-hoc Network (MANET) is a composition of a group of mobile, wireless nodes which cooperate in forwarding packets in a multi-hop fashion without any centralized administration.

In MANET, each mobile node acts as a router as well as an end node which is either source or destination. AODV is perhaps the most well-known routing protocol for MANET [1], which is a hop-by-hop reactive (On demand) source routing protocol, combines DSR and DSDV mechanisms for routing, by using the on-demand mechanism of routing discovery and route maintenance from DSR and the hop-by-hop routing and sequence number from DSDV. For each destination, AODV creates a routing table like DSDV, while DSR uses node cache to maintain routing information [2]. It offers quick adaptation to dynamic link conditions, low processing and memory overhead, low network utilization, and determines unicast routes to destinations within the Ad-hoc network [1]

Destination-Sequenced Distance Vector routing protocol (DSDV) is a typical routing protocol for MANETs, which is based on the Distributed Bellman-Ford algorithm [5]. In DSDV, each route is tagged with a sequence number which is originated by destination, indicating how old the route is [2]. All nodes try to find all paths to possible destinations nodes in a network and the number of hops to each destination and save them in their routing tables. New route broadcasts contain the address of destination, the number of hops to reach the destination, the sequence number of the information receive regarding the destination, as well as a new unique sequence number for the new route broadcast [2].

2.2 ROUTING

2.2.1 Static vs. Dynamic Routing

To achieve consistency, a network administrator can either manually configure each machine with a pre-computed set of routes that he or she knows to be consistent, or the machines can communicate routing information to each other through some kind of protocol. The first approach is known as static routing, and the second as dynamic routing.

2.2.2 Advantages of Static Routing

Static routing has some enormous advantages over dynamic routing. Chief among these advantages is predictability. Because the network administrator computes the routing table in advance, the path a packet takes between two destinations is always known precisely, and can be controlled exactly. With dynamic routing, the path taken depends on which devices and links are functioning, and how the routers have interpreted the updates from other routers.

Additionally, because no dynamic routing protocol is needed, static routing doesn't impose any overhead on the routers or the network links. While this overhead maybe minimal on an FDDI ring, or even on an Ethernet segment, it could be a significant portion of network bandwidth on a low-speed dial-up link. Finally, static routing is easy to configure on a small network.

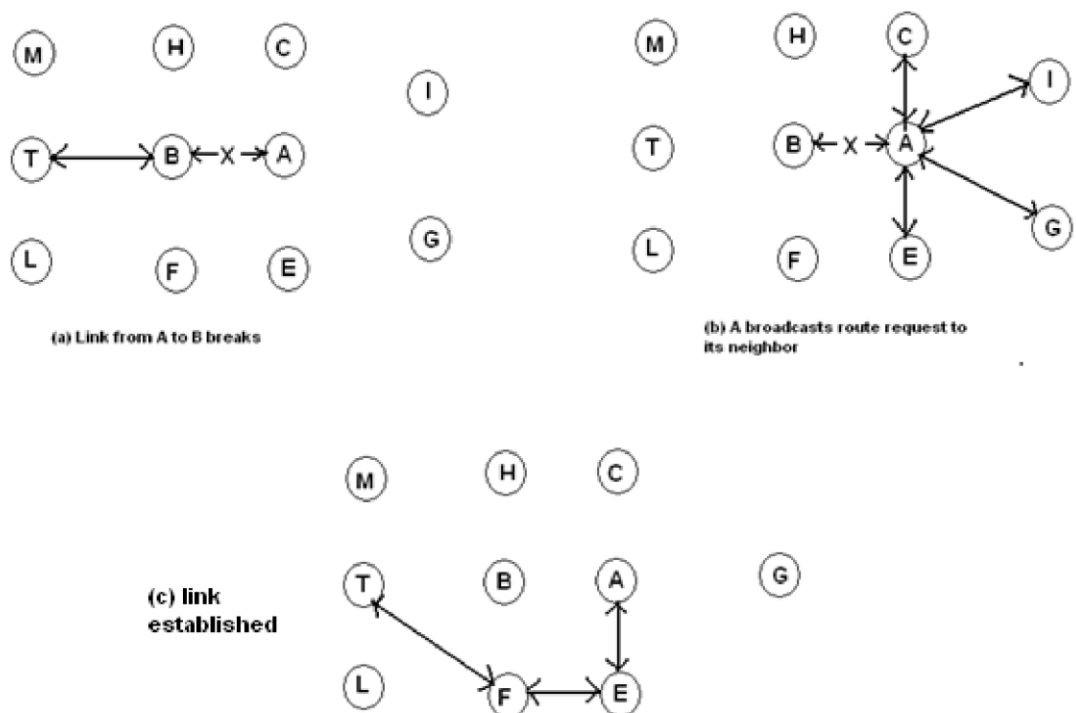


Figure 2.1: Resolving failed links in DSDV

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