Advances in Computational Sciences and Technology
ISSN 0973-6107 Volume 10, Number 5 (2017) pp. 855-861

http://www.ripublication.com

Overview (Advantages and Routing Protocols) of MANET

Siva Krishna Sakalabattula

Department of Information Technology, Sasi Institute of Technology & Engineering, Kadakatla, Tadepalligudem, West Dodavari District, Andhra Pradesh-534101, India.

S Suresh Kumar

Department of Computer Science and Engineering, Sasi Institute of Technology & Engineering, Kadakatla, Tadepalligudem, West Dodavari District, Andhra Pradesh-534101, India.

Abstract

A mobile ad hoc network (MANET) is generally defined as a network that has many free or autonomous nodes, often composed of mobile devices or other mobile pieces that can arrange themselves in various ways and operate without strict top-down network administration. There are many different types of setups that could be called mantes (Mobile Ad Hoc Network) and the potential for this sort of network is still being studied. In view of Experts the MANET, now a topic of commercial research was originally used in military projects, including in tactical networks and Defense Advanced Research Projects Agency (DARPA) projects. Some use 4G networks and other wireless systems as examples of a potential topology for a MANET, while others refer to a vehicular ad-hoc network (VANET), where the free network nodes are installed in cars and other vehicles. In MANET's Data transmission from one node to other nodes requires multiple hops as nodes transmission range is limited which does not extend. Each device in a MANET is free to move independently in any direction, and will therefore change its links to other devices frequently. The main classes of MANET routing protocols are Proactive, Reactive and Hybrid. This paper reviews the aspect of Quality of service and discusses and evaluates Proactive routing protocol by focusing on Optimized Link State Routing Protocol (OLSR) routing protocol for better performance.

I. INTRODUCTION

A "Mobile Ad-hoc Network" consists of mobile wireless nodes. The communication between these mobile nodes is carried out without any centralized control. Traditional routing protocols may not suffice for real time communications it depends upon the condition and our requirements. A mobile ad hoc network (MANET) is a group of mobile, wireless nodes which cooperatively and spontaneously form an IP-based network. This network is independent of any fixed infrastructure or centralized administration. A node communicates directly with nodes within its wireless communication range. Nodes that are part of the MANET, but beyond each other's wireless range communicate using a multi-hop route through other nodes in the network. These multi-hop routes changes with the network topology and are determined using a routing protocol such as DSDV [2], DSR [3], AODV [4], TORA [5], and ZRP [6], etc.To support robust and efficient operation in mobile wireless networks by incorporating routing functionality into mobile nodes. Such networks are envisioned to have dynamic, sometimes rapidly-changing, random, multichip topologies which are likely composed of relatively bandwidth-constrained wireless links.

Goal: To extend mobility into the realm of autonomous, mobile, wireless domains, where a set of nodes– which may be combined routers and hosts– themselves from the network routing infrastructure in an ad hoc fashion

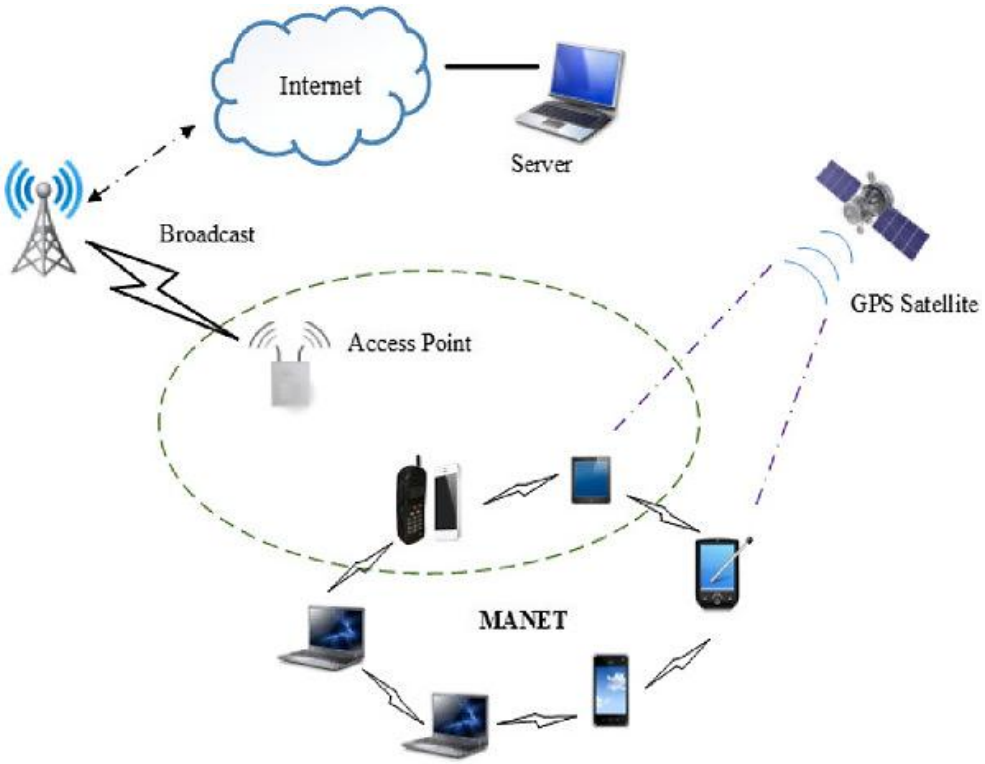


Fig.1 Example of mobile ad-hoc network

Why Ad Hoc Networks?

- Setting up of fixed access points and backbone infrastructure is not always viable
  - Infrastructure may not be present in a disaster area or war zone
  - Infrastructure may not be practical for short-range radios; Bluetooth (range ~ 10m)
- Ad hoc networks:
  - Do not need backbone infrastructure support
  - Are easy to deploy
  - Useful when infrastructure re is absent, destroyed or impractical.
  -

Applications of Manet's

- Personal area networking
  - cell phone, laptop, ear phone, wrist watch
- Military environments
  - soldiers, tanks, planes
- Civilian environments
  - taxi cab network
  - meeting rooms
  - sports stadiums
  - boats, small aircraft
- Emergency operations
  - search-and-rescue
  - policing and fire fighting

II. ADVANTAGES & CHARACTERISTICS OF MANET'S

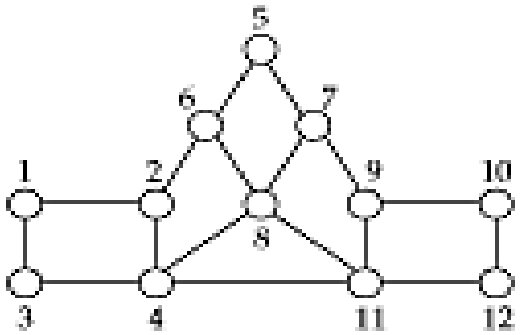
1. Router Free Connection to the internet without any wireless router is the main advantage of using a mobile ad hoc network. Because of this, running an ad hoc network can be more affordable than traditional network.
2. Fault Tolerance MANET supports connection failures, because routing and transmission protocols are designed to manage these situations.
3. Mobile Ad hoc Network is a collection of autonomous and mobile elements such as laptops, smart phones, wearable computers, tablet, PC, PDA etc.

4. The mobile nodes can dynamically self-organize in arbitrary temporary network topology.

III. ROUTING PROTOCOLS IN MANET'S

3.1. Traditional Routing:

A routing protocol sets up a routing table in routers



ROUTING TABLE AT 1

Destination	Next hop	Destination	Next hop
1	—	7	2
2	2□	8□	2□
3	3□	9□	2□
4	3□	10□	2□
5	2□	11□	3□
6	2	12	3

- A node makes a *local* choice depending on *global* topology.

3.2 Distance-vector & Link-state Routing:

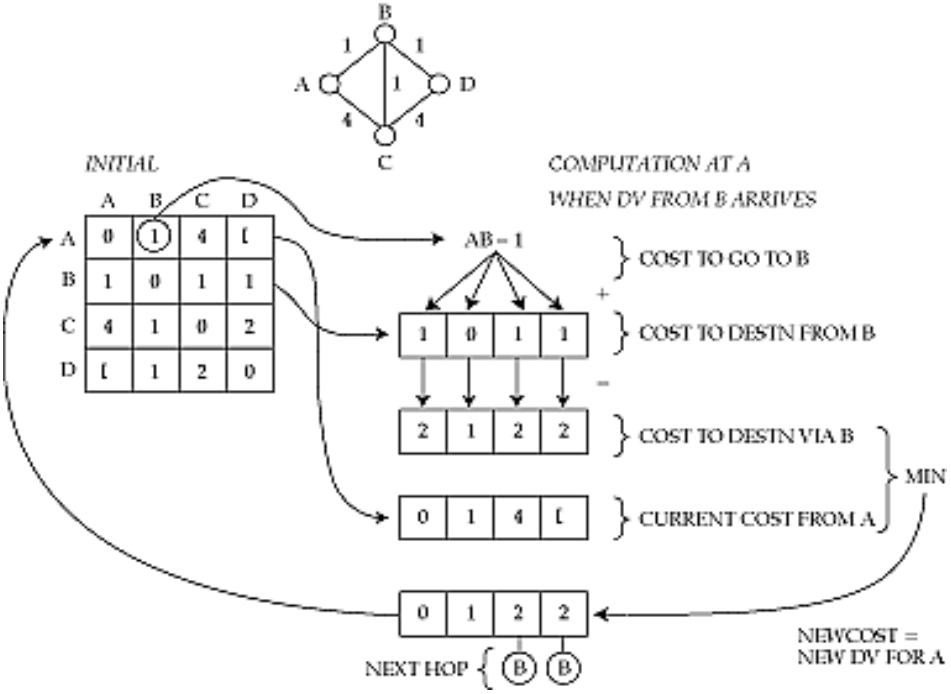
- Both assume router knows

– address of each neighbor

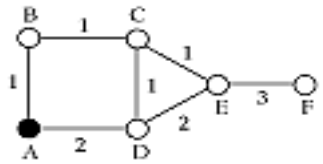
– cost of reaching each neighbor

- Both allow a router to determine global routing information by talking to its neighbors
- Distance vector - router knows cost to each destination
- Link state - router knows entire network topology and computes shortest path

3.3 Distance Vector Routing: Example:

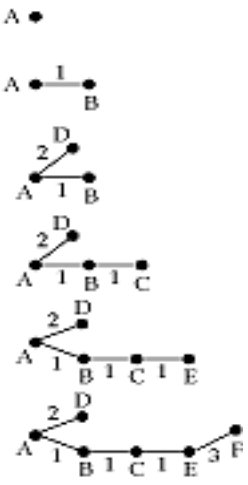


3.4 Link State Routing: Example



B(A,1) means B was reached by A, cost 1

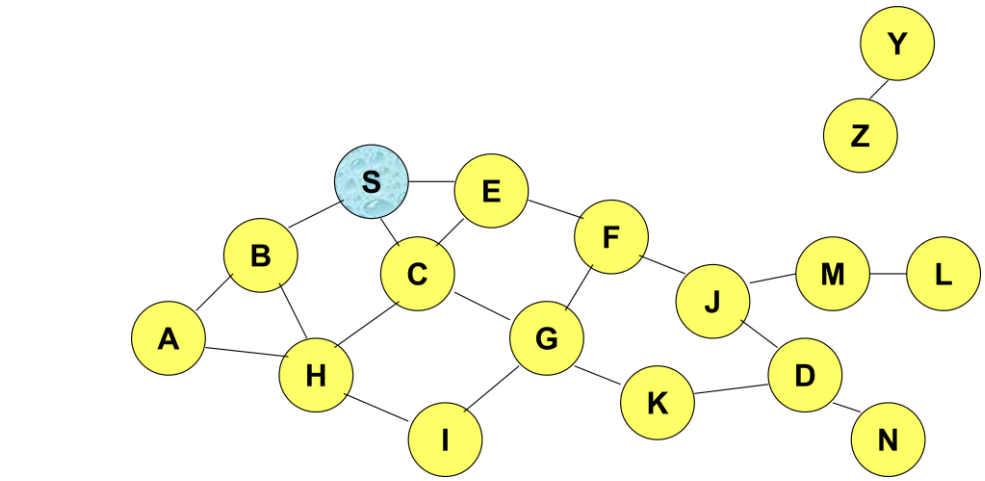
PERMANENT	TEMPORARY	COMMENTS
A	B(A,1), D(A,2)	ROOT AND ITS NEIGHBORS
A, B(A,1)	D(A,2), C(B,2)	ADD C(B,2)
A, B(A,1) D(A,2)	E(D,4), C(B,2)	C(D,3) DIDN'T MAKE IT
A, B(A,1) D(A,2), C(B,2)	E(C,3)	E(D,4) TOO LONG
A, B(A,1) D(A,2), C(B,2) E(C,3)	F(E,6)	
A, B(A,1) C(B,2), D(A,2) E(C,3), F(E,6)	NULL	STOP



IV. DYNAMIC SOURCE ROUTING (DSR)

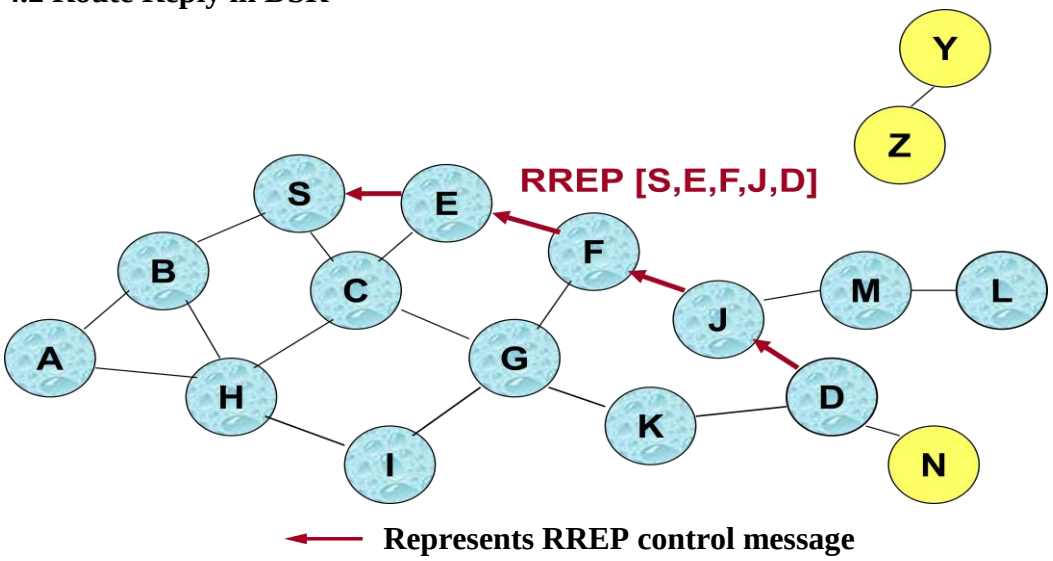
- When node S wants to send a packet to node D, but does not know a route to D, node S initiates a route discovery
- Source node S floods Route Request (RREQ)
- Each node *appends own identifier* when forwarding RREQ

4.1 Route Discovery in DSR



Represents a node that has received RREQ for D from S

4.2 Route Reply in DSR



V. CONCLUSION

A large number of different kinds of routing protocols are practiced in mobile Ad hoc networks. The use of a specific routing protocol in mobile Ad hoc network depends upon number factors including size of the network, load, mobility requirements, routing overhead and end-to-end delay. In recent years on-demand routing protocols have attained more attention in mobile Ad hoc networks as compared to other routing schemes due to their potential flexibility in deployment and efficiency in terms throughput. They are able to organize themselves dynamically with lower memory overhead and lower bandwidth requirement than table driven protocols.

REFERENCES

[1] Vikas Goyal, Shaveta Rani, Paramjit Singh, "Performance Comparison of Routing Protocols for Remote Login in MANETs" International Journal of Computer Science and Mobile Computing, Vol 2, Issue. 7, 413-421, July 2013.

[2] Kuldeep Vats, Amit Rathee, "Simulation and Performance Analysis of OLSR Routing Protocol Using OPNET" International Journal of Advanced Research in Computer Science and Software Engineering 2012

[3] Bapuji, V and Sharma, SSVN and Naik, R Lakshman and Ramesh, D and Manjula, B "Quality of service for mobile Ad-hoc wireless networks" International Journal on Computer Science \& Engineering 2011

[4] Suchita Baxla, Rajesh Nema "A Review Paper on Performance Analysis of AODV, OLSR, DSR and GRP Routing Protocols of Ad hoc Networks'' International Journal of Science and Research (IJSR), Volume 2 Issue 5, May 2013.

[5] Referring http://ietd.inflibnet.ac.in/bitstream/10603/4106/14/14_chapter%206.pdf

[6] Referring http://www.utdallas.edu/~ravip/papers/infocom2002.pdf

[7] Referring www.google.com/manets Wikipedia.

[8]]Reffering prabhleen kaur,Sukhman journal paper in An Overview on MANET- Advantages, Characteristics and Security Attacks