A Survey & Analysis of Routing Protocols for Mobile Ad-hoc network

Snehal Goverdhan,Aakanksha Choubey
Department of Computer science & Engineering
Shri shankarcharya College of Engineering & Technology,Bhilai,(C.G)

Abstract

A mobile ad hoc network (MANET) is a collection of wireless mobile nodes animatedly form a network topology without the use of any presented network communications or centralized administration. Routing is the assignment of directing data packets from a source node to a given destination node. The main procedure for evaluate the performance of MANETs is reproduction. The primary goal of such an ad hoc network routing protocol is truthful and well ordered route founding between a pair of nodes so that communication may be delivered in a suitable manner. Route configuration should be done with an insignificant of transparency and bandwidth consumption. This research paper observes two routing protocols for mobile ad hoc networks– the Destination Sequenced Distance Vector (DSDV) and On- Demand Distance Vector routing (AODV).

Keywords— network protocol data units (NPDUs), Destination Sequenced Distance Vector (DSDV), Mobile ad hoc network (MANET), & Ad hoc On- Demand Distance Vector routing (AODV).

I. Routing Protocols for MANET

In mobile ad hoc networks, Routing is the procedure of choosing paths in a network along which to propel network traffic. Routing in MANET's are extraordinary then wired network due to dynamic behavior of the nodes. Routing protocols are fundamentally classified as following:

Fig. 1 Representation of Classified routing protocol in mobile ad hoc network.

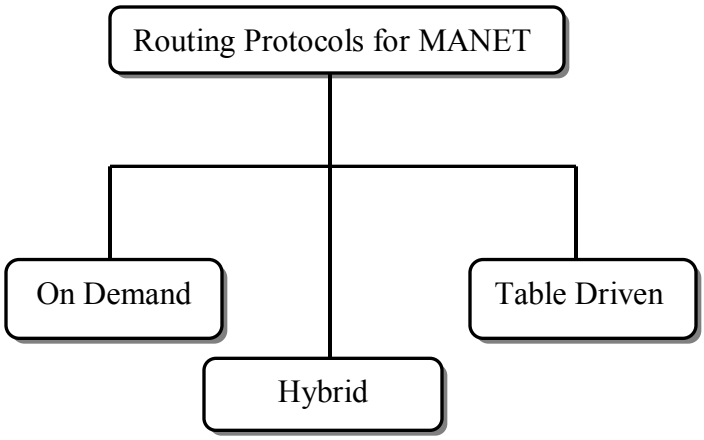

Fig. 1 Classification of routing protocol

Table Driven Routing Protocol

ISSN: 2278 – 1323

Table Driven routing protocol each node maintains tables to store routing information like as destination ip address, next hop, hop count, etc. They respond to changes in network topology by propagating updates throughout the network in order to maintain a consistent network view and the routing information is kept in different tables.

Source-Initiated On-Demand Routing

In Source initiated on-demand routing, when a node requires a direction to a target, will try to send a route request to other nodes & discover route process within the network. This process is finished when a connection is found between sender to target node. Once a direction has been recognized, it is maintained direction preservation method.

Destination Sequence Distance Vector (DSDV)

The Destination-Sequenced Distance-Vector Routing protocol (DSDV) is a Table driven Protocol based on Bellman Ford algorithm. Every movable node in the network maintains a routing table in which all of the possible destinations within the network and the number of hops to each destination are recorded. Routing information must be updated periodically. . Each entry is marked with a sequence number assigned by the destination node. The progression information enables the movable nodes to differentiate fusty routes from original ones, in that way avoiding the configuration of routing loops. Each node gives its routing information to its neighbor nodes.

Routing table updates create lots of control traffic .DSDV addresses this problem by using two types of routing update packets the first is known as a “full dump." This type of packet carries all available routing information and can require multiple network protocol data units (NPDUs) transmitted infrequently. The second is Incremental Updates packets are used to relay only that information which has changed since the last full dump and fits within one network protocol data unit (NPDU). When updates can no longer fit in one NPDU, send full dump. New route broadcasts contain the address of the target, the quantity of hops to make the target, the progression amount of the information established concerning the destination, as well as a new progression quantity. . In the event that two updates have the same progression quantity, the way with the lesser metric is used in organize to optimize (shorten) the pathway.

ISSN: 2278 – 1323

Adhoc on Demand Distance Vector Routing (AODV)

AODV is an improvement on the DSDV. AODV uses a pure - demand approach for finding route. Node does not need to maintain knowledge of another node unless it communicates with it. AODV minimizes the number of broadcasts by creating routes on-demand which is demanded by the source node. AODV includes route discovery and route maintenance procedure.Each packet carries only the destination to determine an up to date path to the destination. AODV uses solitary symmetric associations since the path respond packet follows the reverse path of path demand packet. AODV uses hello messages to know its neighbors and to ensure symmetric links. Each node remembers only the next hop required to reach any of the hosts, not the whole route. Each route entry has associated with it at timer, which indicates the time period for which the route is valid. Maintenance of routes is done by generating and propagating a RREP within finite metric back to the source node by the upstream neighbor of the node, which has moved out of range. Such an RREP is called the link failure indication message. Upon receipt of such a message, the source node can re-initiate the route discovery if it still desires a route to the destination. The final node then sends a route reply packet.

II. Necessitation and Applications of MANET

Wireless networks are being tremendously used in the communiqué between devices of dissimilar types and sizes. Different wireless network standards and technologies have appeared in the last years to make possible easy exploitation of applications. The deployment of wireless networks where there is no communications or the local communications is not reliable can be complicated. Mobile ad hoc networks have been planned in normalize to solve such difficulty. A wireless ad hoc network is a collection of wireless nodes that can energetically self made into a casual and transitory topology to form a network without necessarily using any pre-existing communications.

In MANET's, every node may communicate truthfully to every other nodes that are not honestly associated communicate by forwarding their traffic through mediator nodes. Every ad hoc node acts as a router forwarding data packet to other. Thus smallest design, immediate

ISSN: 2278 – 1323

deployment and nonexistence of a central governing ability make ad hoc networks appropriate for disaster condition like military conflict, emergency situations, natural disasters etc.

MANET is collection of wireless node that can dynamically form a network to exchange the information without any pre-existing fixed network. The major rewards of MANET's are flexibility dynamism & less cost effective. MANET's do not required vertebrae communications and are easy to categorize. Ad hoc networks are useful when infrastructure is absent, destroyed or impractical and can be easily set up, even in wilderness places and can bear to natural catastrophes and war.

- **Applications** of Adhoc networks are emergency search-and–rescue operation, Meeting or convention in which persons wish to speedily share the information.
- **Military battlefield: -** Adhoc networking would permit the military to take benefits of network technology to preserve information between the armed forces, armed information to head quarters & armed vehicles. The fundamental technique of MANET's came from this ground.
- **Commercial sector:-** MANET's can be used in emergency/rescue operations for tragedy assistance pains.
- **Local level: -** Ad hoc networks can separately link an instant and temporary multimedia network using notebook computers or palmtop computers to spread and share information among participants a e.g. meeting or classroom. Another appropriate local level application might be in home networks where devices can communicate directly to exchange information.
- **Virtual Navigation: -** A remote database contains the graphical illustration of streets, buildings and physical characteristics of large metropolises. Blocks of this database are transmitted in rapid sequence to a vehicle where a rendering program permits vehicle occupant to visualize the needed environment ahead of time. They may also "Virtually" see the internal layout of building including an emergency rescue plan.

III. Conclusion & Future Scope

AODV suffers from one end to another end delay. DSDV packet deliverance portion is extremely stumpy for high moving ability.

ISSN: 2278 – 1323

DSDV would be better with regard to the packet deliverance ratio**;** on the other hand it may have substantial routing transparency. As far as data packet wait and dropped data packets ratio are disturbed, Adhoc on Demand Distance Vector Routing seems superior to the DSDV with huge number of nodes. Hence for authentic instance traffic AODV is chosen over the DSDV. For less number of node and less mobility DSDV performance is superior. In this Paper Performs a study of routing protocols DSDV and AODV. Further comparison can be made on DSDV AODV protocols on the basis of performance parameters such as Packet delivery ratio, Average Energy Consumption, Average End-to-End Delay, Network Size, Throughput while varying number of nodes, speed and pause time. In this project we try to switch nodes between active and inactive states to save energy. In Ad hoc network nodes does not sleep. However, not every routing node is involved in the data delivery all the time, as only the least delayed routing path is positively reinforced. Hence, allowing redundant routing nodes to sleep may save other routing paths and contribute to a longer application lifetime when the previous ones run out of energy. In active inactive scheduling, MANET's nodes switch between active and inactive states to accumulate power will help to increases network lifetime.

REFERENCES

1. Sunil Taneja and Ashwani Kush, "A Survey of Routing Protocols in Mobile Ad Hoc Networks", International Journal of Innovation, Management and Technology, Vol. 1, No. 3, pp. 279-285, August 2010.

2. P. Bobade. Nilesh.N. Mhal. Nitiket.2010,Evaluation Of Ad Hoc On Demand Distance Vector in MANETs With Varying Network Size Using NS-2 Simulation. International Journal on Computer Science and Engineering. Volume number 2.Page number:(2731-2735).

3. Devi.Uma. Ahmed. Adeel. Raja. 2013, Average Delay And Throughput Analysis on Ad Hoc Network Protocols. International Journal of Advanced Research in Computer Science and Software Engineering. Volume number 3. Issue number :(2).

4. Kapang Lego, Pranav singh and Dipankar Sutradhar, "Comparative Study Of Adhoc Routing Protocol AODV, DSR and DSDV in Mobile Adhoc Network", Indian Journal of Computer Science and Engineering, Vol.1, No. 4, pp. 364-371, July 2010.

5. Khehra1.Singh.Sandeep.Singla.Abhinash.2013,Performance Analysis Of Broadcast Based Mobile Adhoc Routing Protocol AODV And DSDV. International Journal of Computer Science and Mobile Applications. Volume number 1.Page number :(29-33).

6. Mohseni, S.Hassan, R.Patel, A.Razali, "Comparativereviewstudy of reactive and proactive routing protocols in MANETs", 4th IEEE International Conference on Digital Ecosystems and Technologies, pp. 304-309, 2010.

7. Dhenakaran.S.S.Paravthavarthini.A.2013,An Overview Of Routing Protocols in Mobile Adhoc Networks. International Journal of Advanced Research in Computer Science and Software Engineering .Volume number 3.Issue number: (2).

ISSN: 2278 – 1323

8. Loay Abusalah, Ashfaq Khokhar, Mohsen Guizani, "A Survey Of Secure Mobile Ad Hoc Routing Protocols", IEEE COMMUNICATIONS SURVEYS & TUTORIALS, pp. 78-93, 2008.

9. Hui Xu, Xianren Wuand, Hamid R. Sadjadpour, "A Unified Analysis of Routing Protocols In Manet", IEEE TRANSACTION OF COMMUNICATION, pp. 911-921, March2000.

10. P.V.Patlil. 2012, Performance Evaluation of on demand and Table driven Protocol for Wireless Ad hoc Network. International Journal of Computer Engineering Science. Volume number 2. Issue number: (9).

11. Khan.Rahman.Ur. Khaleel. Zaman.U. Reddy.Venugopal.A.2008, Performance Comparison of On-Demand And Table Driven Ad Hoc Routing Protocols Using NCTUns,Tenth International Conference on Computer Modeling and Simulation.

12. David A. Maltz, Josh Broch and David B. Johnson, "TheEffects of On-Demand Behavior in Routing Protocols for Multihop Wireless Ad Hoc Networks", IEEE JOURNAL, pp. 1439-1453, August 1999.

13. Shrivastva. Deepak. Rajput Singh. Saurabh. Kumar. Hemant.2012, Manet Protocol Analysis With Varying Pause Time Simulation Time And Speed. International Journal of Advanced Research in Computer Engineering & Technology .Volume number 1. Issue number:(8).

14. Singh.Preet.Tanu.Singh.K.R.Vats.Jayant.2011,Routing Protocols In Ad Hoc Networks: A Review. International Journal of Computer Applications.Volume number 25.Issue number: (4).

15. Sisodia.R.S, Manoj.B.S , C. Siva Ram Murthy,2002, A Preferred Link-Based Routing Protocol for Ad Hoc Wireless Networks. Journal of Communications and Networks. vol. 4, no.1. pp:(14-21).

16. Tonk.Ginni.Kashyap.Indu.S.S.Tyagi.2013, Performance Comparison Of Ad-Hoc Network Routing Protocols Using NS-2. International Journal on Computer Science and Engineering Volume number 2.Page number :(2731-2735).

17. Toh.C.K,1997, Associativity-Based Routing for Ad Hoc Mobile Networks, , vol. 4.no. 2. pp:(1-36)

18. Verma.Amandeep.2009,A Study Of Performance Comparisons Of Simulated Ad hoc Network Routing Protocol. Int. J. Comp. Tech. Appl. Volume number 2.Page number:(565-569).

19. Yadav.Singh.Narendra.Yadav.P.R.2008,Performance Comparison And Analysis Of Table-Driven And On-Demand Routing Protocols for Mobile Ad-hoc Network. International Journal of Information Technology..Page numbe:(110-118).

Snehal Goverdhan,ME Scholar, Deptt. Of Computer Science & Engineering, Shri Shankaracharya College of Engineering & Technology Bhilai, India

Prof. Aakanksha Choubey, Deptt. Of Computer Science & Engineering, Shri Shankaracharya College of Engineering & Technology, Bhilai, India.

ISSN: 2278 – 1323