OVERVIEW OF PROACTIVE ROUTING PROTOCOLS IN MOBILE AD-HOC NETWORKS

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Abstract— **The Mobile ad hoc network [MANET] is a distributed network where mobile nodes are connected together by wireless link without any infrastructure like base station, fixed link, routers, and centralized servers. A routing protocol is used to find best path between mobile nodes to established communication within the networks. Route between the mobile nodes should be distinguished and maintain with a minimum of overhead & bandwidth consumption. This paper presents performance evaluation of proactive routing protocols i.e. DSDV, OLSR & WRP based on some parameters**.

Keywords- **MANETs, DSDV, WRP, OLSR.**

I. INTRODUCTION

Ad-hoc wireless networks are self-contour, self-governing systems and distributed network where mobile nodes are connected together by wireless link without any infrastructure like base station, fixed link, routers, and centralized servers. In such a networks data can be transmitted by intermediate nodes which are not in the fixed location. Mobile ad hoc networks are based on a set of nodes which randomly communicate with each other over a wireless medium. The topology of mobile ad hoc network is not static and depends upon the mobility of the nodes so it can adjust rapidly and suddenly [1]. According to the application, the routing protocols for mobile ad-hoc networks can be differ. Basically, the routing protocols are categorized like Proactive routing protocols, Reactive routing protocols & Hybrid routing protocols [2]. The goal of good routing protocol is minimum control overhead, minimum processing overhead, multi-hop path routing capability, dynamic topology maintenance, no loop, self-starting. Proactive routing protocols are beneficial for small networks with high mobility while Reactive routing protocols are useful for large networks with moderate topology changes. Hybrid routing protocols consisting both proactive and reactive routing approaches that means hybrid routing protocols applicable for small networks as well as large networks with high or moderate mobility[7] [8]. Figure 1 describes the classification of routing protocols.
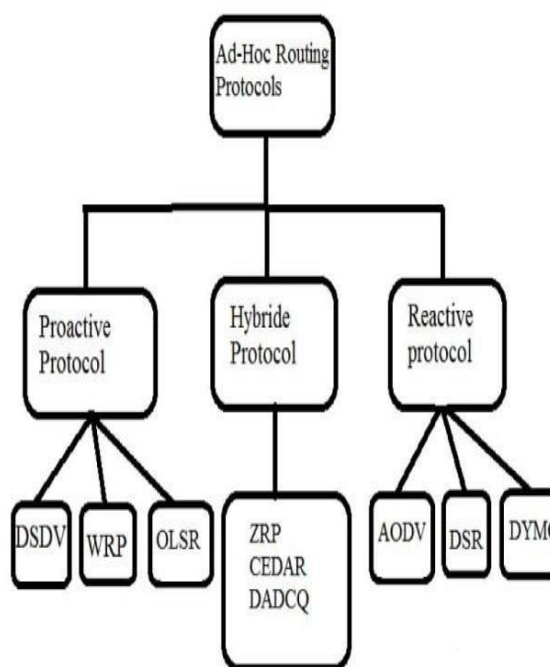

Fig. 1 Classification of Ad-Hoc Routing Protocols

II. SURVEY OF PROACTIVE ROUTING PROTOCOLS

1) *DSDV (DSTINATION-SEQUENCED DISTANCE-VECTOR*): Destination Sequenced Distance Vector routing protocol is a table driven routing protocols which is based on the Bellman –Ford routing mechanism. In DSDV, each node maintains a routing table in which all the available information related to routes are stored. Each entry is assign with a sequence number, number assigned by the destination node routing table updates are periodically transmitted throughout the network in order to maintain routing table. To overcome the looping problem in DSDV the sequenced number is vital and for avoiding the overhead in networks, DSDV uses route update packets. One is 'full dump' which sends the full routing table to the neighbors and other is 'incremental packet' which is sends those entries that has a matric change i.e. sends information related to new route.Proactive protocols tend to perform best in networks with low to moderate mobility, fewer nodes, and many data sessions, but there are some difficulties during link failures and additions of mobile nodes [3].

2) *WRP (WIRELESS ROUTING PROTOCOLS):* The Wireless Routing Protocol (WRP) is another loop free proactive unicast routing protocol. WRP uses Bellman- Ford algorithm to calculate the shortest paths between the mobile nodes.Main difference between WRP and DSDV is table maintenance and in the update procedures. In WRP four tables are used to maintain distance, link cost, routes and message retransmission information. The loop problem is recovered by finding the shortest path to each destination both the distance and the second-to-last hop (predecessor) information, but same difficulties as DSDV occurs in this protocols [4].

3) *OLSR (OPTIMIZED LINK STATE PROTOCOL):* OLSR is a table-driven proactive routing protocol, this protocol optimizes the flooding process and reduces the control message overhead by uses Multi Point Relays [MPR]. In OLSR, each node periodically broadcasts two types of messages:

HELLO messages and Topology Control (TC) messages. The function of Hello messages is to find the information about the link status & the host's neighbors. The basic difference between the hello message and topology control
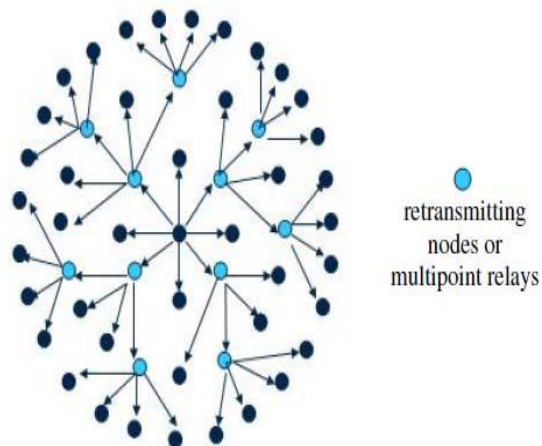

Fig.

2 OLSR Routing mechanisms

message is that the Hello messages sent only to one hop away while TC massage are sent throughout the whole wireless ad-hoc networks [5] [6].

III. COMPARISON BETWEEN DSDV, WRP AND LOSR

1) *DSDV Performance Metrics*
- Large overhead as compared to other routing protocols.
- The performance of the DSDV routing protocols decreases with number of nodes increases in the networks.
- Throughput of this protocol primarily increases but when time is increases then the throughput decreases.
- DSDV routing protocols having stable end to end delay in mobility.

2) *OLSR Performance Metrics*
- Multi Point Relay [MPR] in OLSR protocols controls the overhead.
- OLSR delay increases with number of nodes increases in the networks.

- Maximum throughput achieved by this protocol as compared to other proactive routing protocols.
- In OLSR protocols mobile nodes broadcast the list of MPR selector in the networks instead of neighbor mobile nodes.

3) WRP Performance Metrics
- Less overhead as compared to DSDV because of separated routing tables are used in WRP.
- When route is break between the mobile nodes then route will count as infinity between them.

IV. CONCLUSION

Discussions about the table-driven proactive routing protocols we conclude that every routing protocol have some own strength and weakness depending upon the applications. Most probably, proactive protocols are used for small networks i.e. more effective for less number of mobile nodes within the ad-hoc wireless networks. This paper also represents the information regarding to throughput, overhead, end to end delay and performance of the proactive routing protocols such as-DSDV, WRP and OLSR. We can also analyze the performance of these proactive routing protocols with different strategy in the future.

REFRENCES

[1] Siva Ram C. Murthy and Manoj B.S., "Ad hoc wireless networks: Architecture and Protocols," Prentice Hall Publishers, ISBN 013147023X, 2004.

[2] Elizabeth M. Royer and Chai-Keong Toh, A review of current routing protocols for adhoc mobile wireless networks.Technical report, University of California and Georgia Institute of Technology, USA, 1999.

[3] Nor Surayati Mohamad, Usop Azizol Abdullah and Ahmad Faisal Amri Abidin, Performance Evaluation of AODV, DSDV & DSR Routing Protocol in Grid Environment, *IJCSNS* International Journal of Computer Science andNetwork Security, 9(7)261, 2009.

[4] E. Royer and C. K. Toh, "A Review of Current Routing Protocols for Ad Hoc Mobile Wireless Networks," *IEEE Personal Communications*, April, 1999.

[5] T. Clausen and P. Jacquet, "Optimized Link State Routing Protocol (OLSR)," The Internet Engineering Taskforce RFC 3626, Oct, 2003.

[6] P. Jacquet, P. Muhlethaler, T. Clausen, A. Laouiti, A. Qayyum, and L. Viennot, "Optimized Link State Routing Protocol for Ad Hoc Networks," in Proc. of IEEE International Multi Topic Conference on Technology for the 21st Century, 2001, pp. 62- 68.

[7] Rupal Satija, "Comparison between different Routing Protocol for Mobile Adhoc Network," International Journal of Current Engineering and Technology, Vol.4, No.4 Aug, 2014.