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# Effect of CBR, FTP and FTP GENERIC Traffic Patterns on the Performance of Routing Protocols in MANET

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***Abstract:*** In recent years mobile ad hoc networks have become very popular and lots of research is being done on different aspects of MANET. Mobile ad hoc network (MANET) is a wireless network without infrastructure. In this paper, an attempt has been made to evaluate the performance of two well known routing protocols AODV and DSR .Three traffic patterns CBR, FTP and FTP GENERIC are used to check the performance of routing protocols ( AODV,DSR) with various metrics like as Packet Delivery Ratio and throughput using GLoMoSIM **(**Global Mobile information systems simulation).

***Keywords:*** *AODV, CBR, DSR, FTP, FTP GENRIC, GloMoSIM.*

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## I INTRODUCTION

Wireless network is more popular in these days. In this network understand end to end communication in cooperative manners. In this, multiple nodes are used to form a multi hope route. It is a combination of mobile nodes; each node is equipped with receiver and transmitter. These networks inherit the traditional problems of wireless and mobile communications, like as transmission-quality enhancement, power control, and bandwidth optimization. In a wireless network, the communication between different network components can be either wired or wireless. In wireless communication cannot use physical cables, it allows certain freedom for the hosts and/or routers in the wireless network to move. This is main advantages of a wireless Network components is connected wireless and they are communicate with others using wireless network. In this wireless network to calculate different radio frequency (RF) spectrum ranges are used. Nodes communicate to each other and also forward packets one nodes to other nodes through router.

## II MANET

A mobile ad hoc network (MANET) is a wireless network that used in multi-hop peer to-peer. In this MANETs is move independently in any Direction. MANETs is a continuously self-configuring, infrastructure less of mobile device. In this network that are connected applications in speedy deployed and dynamic military and civilian systems. Therefore, the primary challenges in building in MANETs are equipping each device to continuously to maintain the information that is required in route traffic. For example, some assumptions used by these protocols are not valid in MANETs or some protocols cannot efficiently handle topology changes. MANET are a kind of wireless ad hoc network that usually has a routable networking environment and improving existing MANET routing protocols before any routing protocols are standardize during simulations.. A mobile is popular topic in1990s. Some of these mobile hosts are willing to forward packets for neighbors one to others. Examples include vehicle-to-vehicle networks that communicate with each other by replying on peer-to-peer routing. In this MANET topology usually changes with time.

## III ROUTING IN MANET

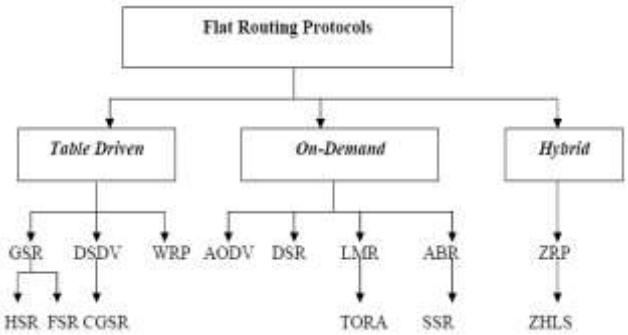
A routing protocol is the mechanism by which user traffic is directed and transported through the network from the source node to the destination node. Routing is the process of selecting paths in a network along which data to be sent. In an ad-hoc network, mobile nodes communicate with each other using multi hop wireless links. There is no stationary infrastructure; each node in the network also acts as a router, forwarding data packets for other nodes. A central challenge in the design of ad-hoc networks is the development of dynamic routing protocols that can efficiently find routes between two communicating nodes. The routing protocols can be mainly categorized as: Flat routing, Hierarchical routing and Location aware routing.

### Flat Routing

There are two schemes in flat routing, namely, table-driven (or proactive) routing protocols and on-demand (or reactive) routing protocols.

**A. Table-Driven Routing (Global/Proactive protocols)**

In these routing protocols, the routes of all network are determined periodically manner. Through the number of tables used by the different protocols differs. The various tables driven routing protocols is based on routing data. These are updating the routing information in a table.




Some of such routing protocols are:

- Destination Sequence Distance Vector Routing
- Wireless Routing Protocol

**B. On-Demand Routing (Reactive Protocols)**

A different approach from table driven routing is On-Demand Routing. This type of routing creates routes only when desired by the source node. This means that the routes are determined and maintained for the nodes that are required to send data to a particular process within the network. This process is completed once a route is found or all possible route permutations have been examined. Once a route has been established, it is maintained by a route maintenance procedure until either the destination becomes in accessible along every path from the source or until the route is no longer desired. The following protocol falls in this category:

- Ad Hoc On Demand Routing Protocol
- Dynamic Source Routing

**(a) Ad hoc On-demand Distance Vector (AODV)**

AODV is a very simple, efficient, and effective routing protocol for Mobile Ad-hoc Networks which do not have fixed topology. AODV enables "dynamic, self-starting, multi-hop routing between mobile nodes wishing to establish and maintain an ad hoc network" This algorithm was motivated by the limited bandwidth that is available in the media that are used for wireless communications. It borrows most of the advantageous concepts from DSR and DSDV algorithms. AODV belongs to the class of Distance Vector Routing Protocols (DV). In a DV every node knows its neighbours and the costs to reach them. A node maintains its own routing table, storing all nodes in the network, the distance and the next hop to them. If a node is not reachable the distance to it is set to infinity.

**(b) Dynamic State Routing (DSR)**

Dynamic Source Routing (DSR) is a routing protocol for wireless mesh networks. It is similar to AODV in that it establishes a route on-demand when a transmitting mobile node requests one. However, it uses source routing instead of relying on the routing table at each intermediate device [13].Dynamic source routing protocol (DSR) is an on-demand, source routing protocol ,whereby all the routing information is maintained (continually updated) at mobile nodes. DSR allows the network to be completely self-organizing and self-configuring, without the need for any existing network infrastructure or administration. The protocol is composed of the two main mechanisms of "Route Discovery" and "Route Maintenance", which work together to allow nodes to discover and maintain routes to arbitrary destinations in the ad hoc network. An optimum path for a communication between a source node and target node is determined by Route Discovery process. Route Maintenance ensures that the communication path remains optimum and loop-free according the change in network conditions, even if this requires altering the route during a transmission.

**IV SIMULATION ENVIRONMENT AND PERFORMANCE EVALUATION SETUP**:

**Simulation** is the imitation of the operation of a real-world process or system over time. GloMoSIM stands for Global Mobile Information System Simulator and is a scalable network simulation environment for mobile ad-hoc networks, developed at UCLA Parallel Computing Laboratory. GloMoSIM uses a parallel discrete event simulation capability provided by Parsec (Parallel Simulation Environment for Complex Systems) which is C based simulation language. GloMoSIM simulates networks with up to thousand nodes linked by a heterogeneous communications capability that includes multicast, asymmetric communications using direct satellite broadcasts, multi-hop wireless communications using adhoc networking, and traditional Internet protocols [14]. Lists the GloMoSIM models currently available at each of the major layers.

| Layer | Model |
|---|---|
| Physical (Radio Propagation) | Free space, Two-Ray |
| Data Link (MAC) | CSMA, MACA, TSMA, 802.11 |
| Network (Routing) | Bellman-Ford, FSR, AODV,LAR, DSR, WRP |
| Transport | TCP, UDP |
| Application | Telnet, FTP |

**V. MOBILITY MODELS**

Mobility models that present the movement of mobile users, their location, velocity and acceleration. These models are determining the performance of a protocol. In this that is evaluate the mobile ad hoc network in routing protocols. It is very simple and wide availability.

**Random Way Point Mobility Model**

In this that is evaluate the mobile ad hoc network in routing protocols. It is very simple and wide availability. In this study Random Way Point mobility mode have used. Random Way Point [13] model is a commonly used simulation purpose in Ad Hoc networks. Random Way Point (RWP) is new network protocols are evaluated. This model is briefly summarized below: i each node moves along a straight line in a zigzag fashion from one waypoint to the next. ii. The waypoints are uniformly distributed over the deployment area. iii. The node velocities are randomly selected from a given range. iv. Optionally, the nodes may have so called "thinking times" by which when they reach a waypoint they choose a random pausing time independent of each other before continuing to the next one. In this models to movement of mobile user are represented when location, acceleration and velocity. This model is very to evaluate the performance rapidly.

**VI. Simulation Parameter:**

The parameters used for carrying out simulation are summarized in the Table:

| Parameter | Value |
|---|---|
| Simulation Time(Sec) | 400 |
| Area | 1000*1000 |
| MAC Protocol | 802.11 |
| Routing Protocol | AODV,DSR |
| Mobility Model | Random way Point |
| Propagation Model | Two-Ray |

| Traffic Source | CBR,FTP,FTP GENERIC |
|---|---|
| Seed[st.pt] | 1 |
| Transmission Range | 376.782m |
| Node Placement | Random |

**VII. Performance Matrices**

There is various performance metrics that can be used to evaluate the performance of ad-hoc routing protocol. There are two main factors over which the performance of the AODV, DSR will be analyzed that are Packet Delivery Ratio and Throughput.

**1) Packet Delivery Ratio (PDR):** It is the ratio of data packets delivered to the destination to those generated by the sources. Packet delivery ratio is calculated by dividing the number of packets received by the destination through the number of packets originated by the source. Mathematical form is expressed in equation.

Packet delivery Ratio (PDR) = Received Packets /Sent Packets

**2) Average Throughput:** Throughput measures the efficiency of the system. The rate of successfully transmitted data per second in the network during the simulation. It is measured in bits/sec. Throughput can be represented mathematically as in equation:-

Throughput = number of delivered packet+ packet size*8

Total duration of simulation

Here we present a comparative analysis of the performance metrics of the routing protocols AODV and DSR with both CBR and FTP traffic sources for different Number of Nodes (10, 20, 30, 40, 50, 60, 70, and 80)

**Results (Scenario: Various Numbers of Nodes)**

**For CBR Traffic Generator:** The performance of the routing protocols in terms of packet delivery ratio and throughput is examined with respect to Number of nodes.

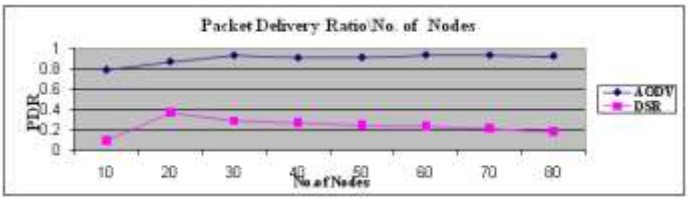



**Figure 1: Packet Delivery ratio\No. of Nodes**

Figure 1: shows that at starting AODV perform better when the number of nodes increases because nodes become more stationary will lead to more stable path from source to destination.

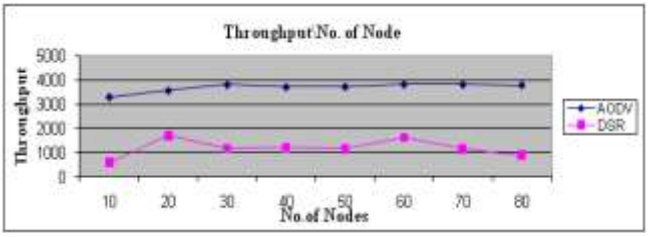



**Figure 2: Throughput\No. of Node**

Figure 2 shows that the performance of the routing protocols in terms of Average Throughput is examined with respect to Nodes. Throughput of AODV increased and consistent when the number of nodes increases. Performance of DSR are fluctuate at increasing the node is not affected the performance AODV.

**Result for FTP Traffic Generator:**

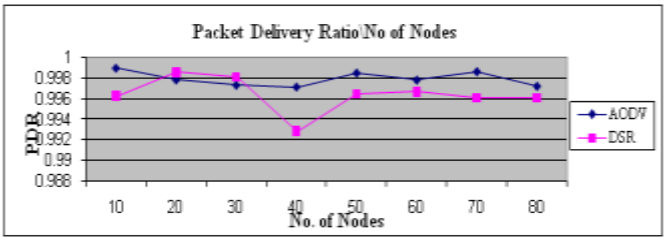



**Figure 3: Packet Delivery Ratio\No. of Node**

Figure 3: shown at starting point of AODV node speed better after sometime they have many variation nodes are more fluctuation. DSR performance dropped as number of nodes increases then suddenly fall down at DSR node 40 has performance will be down after that DSR are constantly increase.

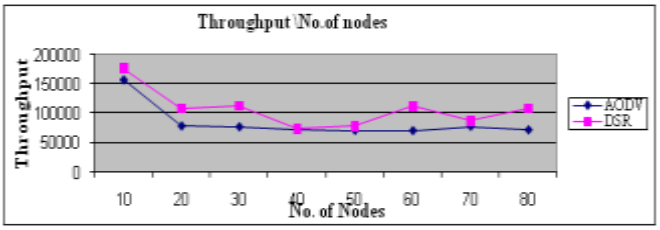



**Figure 4: Throughput\No. of Node**

Figure 4: In FTP case throughput number of node increase the AODV performance will be bad .DSR are more fluctuate at number of node but performance is better than AODV.

**Results for FTP GENERIC Traffic Generator:**

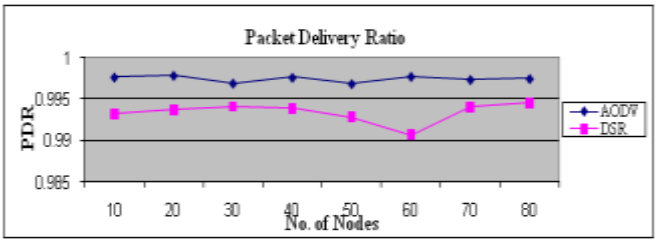



**Figure 5: Packet Delivery Ratio\No. of nodes**

Figure 5: The performance of routing protocol AODV is fluctuating at number of nodes increase. In DSR case at point 10 highly increase and constantly after that there will be fall down. But AODV is better performance.

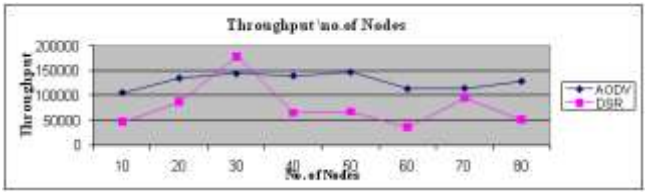



**Figure 6: Throughput\No. of Nodes**

Figure 6: Throughput of AODV increased and consistent when the number of node increases. DSR are more fluctuate at any number of Nodes increase.

## VII. CONCLUSION

Here AODV and DSR routing protocols are studied with CBR and FTP and FTP GENRIC Traffic pattern. The performance evaluation parameters for these protocols are PDR and Throughput.

**Conclusion for CBR, FTP and FTP GENRIC Traffic:**

In this paper, the performance of two protocols AODV and DSR using various numbers of nodes. It is observed that Packet Delivery Ratio of AODV is very high and increase when the number of nodes increases. DSR has very less PDR and perform very poor. Throughput of AODV is also high as comparison to DSR. PDR of all two protocols changes dramatically with various numbers of Nodes. Throughput of DSR is also high as comparison to AODV in three traffic pattern. So, conclusion is that if the MANET has to be setup for a large network, then AODV should be prefer due to high Packet Delivery Ratio and higher Throughput. AODV perform very well as compare to DSR for Traffic Pattern CBR, FTP and FTP GENRIC. The performance of AODV is higher with CBR Traffic pattern as compare to FTP. With FTP the performance of DSR is also good. So, AODV is a best protocol for MANET with FTP, FTP GENRIC Traffic Pattern.

## REFERENCES

[1] H. Deng, W. Li, Agrawal, D.P., "Routing security in wireless ad hoc networks," Cincinnati Univ., OH, USA; IEEE Communications Magazine, Oct. 2002, Volume: 40, page(s): 70- 75, ISSN: 0163-6804

[2] C. E. Perkins, "Ad Hoc Networking," Addison-Wesley Longman, 2000.

[3] Robert Castaneda and Samir R. Das, "Query Localization Techniques for On-demand Routing Protocols in Ad Hoc Networks," In Proc. of the 5th International Conference on Mobile Computing and Networking (MobiCom'99). ACM, August 1999.

[4] A. Vahdat, B. Becker: Epidemic Routing for Partially-Connected Ad Hoc Networks.

[5] Vaduvur Bharghavan, Alan Demers, Scott Shenker, and Lixia Zhang, "MACAW: A media access protocol for wireless LAN's," In Proc. of the SIGCOMM '94 Conference on Communications Architectures, Protocols and Applications, pages 212–225, August 1994.

[6] C. E. Perkins and E. M. Royer, "The Ad Hoc On-Demand Distance-Vector Protocol (AODV)," In Ad Hoc Networking, C. E. Perkins (Ed.), pages.

[7] C. Perkins, "Ad hoc On Demand Distance Vector (AODV) Routing," Internet draft, draft-ietfmanet- aodv-00.txt.

[8] D. B. Johnson and D. A. Maltz, "Dynamic Source Routing," in Ad Hoc Wireless Networks, Mobile Computing, T. Imielinski and H. Korth (Eds.), Chapter 5, pp. 153–181, Kluwer Academic Publishers, 1996.

[9] D. B. Johnson, D. A. Maltz, and J. Broch, "DSR: The Dynamic Source Routing Protocol for Multihop Wireless Ad Hoc Networks," In Ad Hoc Networking, C. E. Perkins (Ed.), pages 139–172, Addison-Wesley, 2001.

[10] V.Park and S. Corson, "Temporally-Ordered Routing Algorithm (TORA) Ver.1 Functional Specification," IETF draft, 2001.

[11] David B. Johnson, "Validation of Wireless and Mobile Network Models and Simulation," In Proc. DARPA/NIST Workshop on Validation of Large- Scale Network Models and Simulation Fairfax, VA, May 1999.

[12] C.Perkins, E.Royer and S Das, ―Ad-hoc on demand distance vector (aodv) routing,‖ in IETF Internet Draft(work in progress), Nov.2000.

[13] D. B. Johnson and D. A. Maltz, ―Dynamic Source Routing in Ad Hoc Wireless Networks, Mobile Computing‖ , Chapter 5, pp. 153-181, Kluwer Academic Publishers, 1996.