



# PERFORMANCE EVALUATION OF UNICAST AND MULTICAST ROUTING IN WIRELESS AD-HOC NETWORKS

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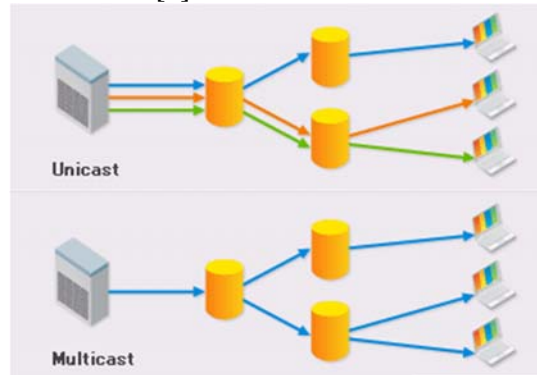
**Abstract - An Ad-hoc network is a collection of autonomous mobile nodes which communicates through multi-hop wireless links. Broadcasting, unicasting and multicasting are different communication techniques. There are various application where collaborative or group communication is required, multicasting is the best choice to go for as compare to unicasting communication. This paper presents performance evaluation of multicast and unicast routing protocol. A network simulator NS-2.35 is used for the performance evaluation. Two performance parameters, packet delivery fraction and throughput are taken for the analysis of the AODV (unicast) and PUMA (multicast) routing protocols.**

**Index Terms - Unicast, Multicast, Ad-hoc n/w, NS 2.35**

## I. INTRODUCTION

Ad hoc network are self-organizing in nature and does not depends on a pre-existing infrastructure. There are some applications like video conferencing, military battlefield, emergency disaster relief etc, where we need to go for Collaboration and communication among all the group members. Multicasting is such technique where one node in a group initiates delivery of information and all other members in a group receives it. Under multicast communications, a single stream of data can be shared with multiple recipients and data is only duplicated when required, where in unicasting multiple copies of same packets are send to the other nodes which waste network bandwidth and other network resources. So, goal is to provide multiple packets to multiple receivers using bandwidth and energy

efficiently instead of using multiple unicast transmissions [3].



[Figure 1: Unicast Vs Multicast]

## II. SIMULATION RESULTS AND ANALYSIS

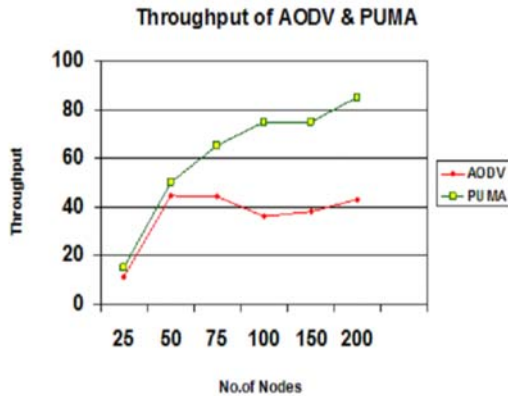
Performance comparison of unicast routing protocol AODV and multicast routing protocol PUMA is done using network simulator 2.35. Standard simulator parameters are taken for the experiment. PUMA protocol is not already integrated in Network simulator 2.35 so first it has been installed and integrated with NS-2.35.

### Simulation Parameters[1][2]

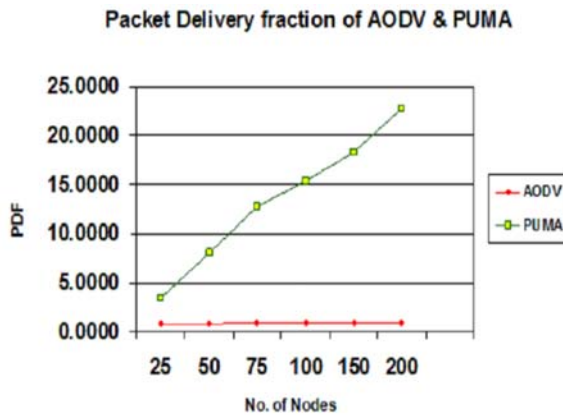
**Table : 1**

Total number of nodes	25 to 200
Area	100 m X 100m
Simulation Time	100 s
Mobility Model	Random way point model
Minimum Speed	1 m/s
Maximum Speed	10 m/s
MAC layer	IEEE 802.11
Direction Antenna Model	Omni Antenna
Traffic Generator	CBR

According to results shown in Figures 2 and 3 PUMA outperforms AODV with respect to the metrics like packet delivery Fraction and throughput.



[Figure 2: Throughput]



[Figure 3: PDF]

### III. CONCLUSION

In this paper multicast routing protocol, Protocol for Unified Multicasting through Announcements (PUMA) is compared with unicast routing protocol, Ad hoc On-Demand Distance Vector (AODV) with standard simulation parameters. Simulation results shows that, PUMA outperforms AODV for the performance metrics such as packet delivery fraction and throughput. This is because in AODV, per source flooding increasing congestion in the network hence leads to more number of packet loss. Also when the node density increases to more than 200 nodes, simulation of AODV fails for the scenario assumed in the simulation.

### IV. REFERENCES

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