Survey on Simulation of Enhanced Routing Protocols in MANET Using Markov Chain Process

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ABSTRACT
MANET is a self-directed structure of mobile nodes connected by wireless links. Ad hoc networks are characterized by multi-hop wireless connectivity, frequently changing network topology. All nodes operate not only as an end system of the network, but also as work as a router to forward the packets. It may be necessary for one mobile node to schedule other hosts for forwarding a packet from source to destination node due to the constrained transmission range of wireless network interfaces. Therefore a self-motivated routing protocol is required. A number of Routing protocols have been created to achieve this task. The contribution of this paper is to critically analyze the performance of the various routing protocols which are reported in the available survey. This survey helps in understanding the problem domain and can also be used to develop a new protocol or to extend existing schemes. The most commonly used routing protocols AODV, DSR, TORA, DSDV are taken and they are studied.

Key Words: AODV, DSR, DSDV, MANET, TORA.

1. INTRODUCTION

Recently mobile ad hoc networks have become very popular. A MANET is collection of mobile nodes sharing a wireless channel without any centralized control or established communication backbone. MANET has Dynamic topology. In MANETs mobile nodes communicate with each other in a multi-hop fashion. That means a mobile node sends a packet to a destination through intermediate nodes and each node can act as an end system and also can act as a router. Because of above mentioned characteristics, routing is a very important challenge in MANET. Routing protocols for MANETs broadly classified in two classes: proactive and reactive. In proactive routing protocols such as DSDV mobile nodes update their routing tables by periodically exchanging routing information among them. Due to periodic information exchanges, a proactive routing protocol generates large number of control messages in the network. Hence, proactive routing protocols are not considered suitable for MANETs. To overcome the limitations of proactive routing protocols, reactive routing protocols such as AODV, DSR and TORA have been proposed for MANET. In a reactive routing protocol, a route is discovered when it is required. It is a well known fact that most of these protocols have certain weaknesses. Some of the main problem includes Limitation: Most of the well known protocols in this area are limited to a particular scenario i.e. does not perform well in all environments Lack of analytical studies not sufficient work has been done to evaluate their performance with respect to other techniques of similar types. Moreover, proposed schemes focus on routing without considering their affects on some other routing relates issues. The contribution of this paper is to collect and critically evaluate all those protocols that are proposed as a routing solution for mobile ad-hoc network. Moreover, it could also be used to either extend existing schemes or to develop new routing solutions.

2. LITERATURE SURVEY

In this section we focus on various routing protocols performance. [1] Describes the comparison of AODV, DSDV, DSR and TORA routing protocol in mobile ad hoc networks to determine the best operational conditions for each protocol. Analyses these routing protocols by extensive simulations in ns-2 simulator and show that how Time delay and number of nodes affect their performance. In this, study performance is measured in terms of Packet Delivery Ratio, Network Life Time, System Life Time, End-to-End Delay and Routing Overhead. By using simulation results it shows that DSDV gives better performance in wide range of simulation conditions.[2] Ashraf Abu-Ein1, Jihad Nader2 describes that a new routing protocol for Mobile Ad-Hoc networks (MANETs) is presented; the proposed power-hop based Ad-hoc on demand Distance Vector (AODV) is named as PH-AODV, it uses the node power and the hop count parameters to select the best routing path. This technique is used to improve the performance of AODV routing protocol. This compares the performance of the proposed PH-AODV in terms of Throughput and Energy efficiency. By the analysis results reveal that PH-AODV is much better than AODV.[3] G.L. Saini, Deepak Dembla describes the performance of Mobile Ad-Hoc network routing protocols DSDV, AODV and DSR. The performances of routing protocols are evaluated by varying mobility
and scalability. The performance metrics includes PDF (Packet Delivery Fraction), Throughput, End to End Delay, NRL (Normalized Routing Load) and Packet Lost. By the simulation it is observed that the performance of reactive routing protocols DSR and AODV performed significantly better than proactive routing protocol DSDV for the CBR based traffic in terms of packet delivery fraction, throughput, and packet lost and NRL. [4] Charles E. Perkins, Centre Elizabeth M. Royer, Samir R. Das describes the comparison of two routing protocols DSR and AODV that share similar on demand behaviour, the differences in the protocol mechanics can lead to significant performance differentials. The performance differentials are analyzed using varying network load, mobility, and network size. Based on the observations, we make recommendations about how the performance of either protocol can be improved. The important performance metrics are Packet delivery fraction, Average end-to-end delay of data packets, Normalized routing load.[5] Anuj K. Gupta, member, IACSIT, Dr. Harsh Sadawarti, Dr. Anil K. Verma Describes the on-demand routing protocols with identical loads and environment conditions and evaluates their relative performance with respect to the two performance metrics such as average End-to-End delay and packet delivery ratio. We investigated various simulation scenarios with varying pause times. From the detailed simulation results and analysis AODV has overall best performance. It has an improvement of DSR and DSDV and has advantages of both of them. TORA performs better at high speed high mobility and has a high throughput as compared to AODV and DSR. It often serves as the underlying protocol for lightweight adaptive multicast algorithms. Whereas DSR suits for network in which mobiles move at moderate speed. It has a significant overhead as the packet size is large carrying full routing information.[6] R. O. Schmidt and M. A. S. Trentin proposes that an effective MANET routing protocol must be equipped to deal with the dynamic and unpredictable topology changes associated with mobile nodes, whilst also being aware of the limited wireless bandwidth and device power considerations which may lead to reductions in transmission range or throughput. This is expanded upon by [7] E. Alotaibi and B. Mukherjee who propose that in addition to these core requirements; MANET routing protocols should also be decentralized, self-healing and self-organising and able to exploit multi-hopping and load balancing, these requirements ensure MANET routing protocols ability to operate autonomously.

3. CONCLUSION

From these conclusions some are of common types while rest varies from one protocol to the other. In general most of the protocols lack with implementation. And those who have been implemented are limited to a particular environment. And also Lack of the studies about these protocols is also an issue. Apart from some of the main schemes existing literature are silent about most of the schemes discussed in this paper. It makes it more difficult to evaluate these schemes in comparison with some of the schemes that follow same operational pattern. This fact also poses an additional obstacle in their further development. It is a well known fact that ad-hoc network suffer with different issues. Some of the most prominent issues are bandwidth constraints and limited power of mobile devices throughput, packet delivery. Most of the schemes mentioned above clearly lacks in handling this protocols. For these we need of a routing solution that can not only offer a better routing solution but also address some of the other routing related issues.

4. FUTURE WORK

In our future work to improve the routing protocols performance we can use another technique like markov chain process. It’s a random process so the performance of various routing protocols can be improved.

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