



A Survey of Mobile Agent Based Efficient DSR Protocol

Manoj Jhuria¹, Shailendra Singh²

^{1,2}Department of Computer Engineering And Application,
National Institute Of Technical Teacher's Training And Research,
Shyamla Hills, Bhopal (M.P.) India.

Abstract: The Dynamic Source Routing protocol (DSR) provides excellent performance for routing in multi-hop wireless ad hoc networks. DSR has very low routing overhead and is able to correctly deliver almost all originated data packets, even with continuous, fast motion of all nodes within the network. The assessment of routing protocols for wireless networks may be a troublesome task, due to the networks' dynamic behavior and also the absence of benchmarks. However, a number of these networks, link in-wireless sensor networks, periodic or cyclic networks, and a few delay tolerant networks (DTNs), have a lot of foreseeable dynamics, because the temporal variations within the constellation is thought about as settled, which may make them easier to study. DSR permits the network to be fully self-organizing and self-configuring, while not the necessity for any existing network infrastructure or management. The protocol consists of the two mechanisms of Route Discovery and Route Maintenance that work along to permit nodes to get and maintain supply routes to absolute destinations within the ad hoc network. Hence this paper proposes a strong research interest in a field related to mobile agent and improving the DSR algorithm in Mobile Ad-hoc Network (MANET).

Keywords: Mobile Ad-hoc Network (MANET), Mobile Agent, DSR Routing.

I. Introduction

The Dynamic Source Routing protocol (DSR) is a simple and efficient routing protocol designed specifically for use in multi-hop wireless ad hoc networks of mobile nodes. [10] Using DSR, the network is totally self-organizing and self configuring, requiring no existing network Infrastructure or administration. Network nodes (Computers) cooperate to forward packets for each other to allow communication over multiple "hops" between nodes not directly within wireless transmission range of one another. [1] As nodes within the network move regarding or be part of or leave the network, and as wireless transmission conditions like sources of interference modification, all routing is mechanically determined and maintained by the DSR routing protocol. Since the amount or sequence of intermediate hops required to achieve any destination might modification at any time, the ensuing configuration could also be quite wealthy and quickly ever-changing. The DSR protocol permits nodes to dynamically discover a supply route across multiple network hops to any destination within the unintended network. Every knowledge packet sent then carries in its header the whole, ordered list of nodes through that the packet should pass, permitting the packet routing to be trivially loop-free and avoiding the requirement for up-to-date routing info within the intermediate nodes through that the packet is forwarded. Buy together with this supply route within the header of every knowledge packet, alternative nodes forwarding or overhearing any of those packets might also simply cache this routing info for future use. This paper presents a mobile agent based approach to overcome the problem of different research survey of the MANET. And also describe the improved of DSR algorithm. [1]

II. Literature Review

This section presents a summary of a number of the foremost relevant literatures on the market within the same field. Initial of all the detail discretion of the DSR protocol is provided by David B. Johnson et al [1] they need to evaluate the operation of the DSR through elaborate simulation on a spread of movement and communication patterns, and thru implementation and important experimentation in a very physical out of doors unplanned networking workplace they need created in an urban center, and have incontestable the wonderful performance of the protocol. [2] They analyze the relevancy of the evolving graph theory within the construction of economical routing protocols in realistic situations. [3] Associate in Nursing Intelligent mobile agent named the NEURAL Agent and compared it with traditional DSR. This autonomous agent coordinates the gathering of data by group action, planning, scheduling, and creating call procedures with alternative agents through completely

different modules that operate asynchronously. [5] A Location-specific knowledge retrieval technique for a MANET mistreatment mobile agent. They propose the geographically certain Mobile Agent (GBMA) that could be a mobile agent that migrates to continually be situated in a much selected region. Moreover, to clarify wherever the GBMA ought to be situated and once the GBMA starts to migrate, we tend to introduce 2 geographic zones: needed zone and expected soon. Compared with the standard strategies with Geo forged or with a standard mobile agent, the GBMA with these zones for retrieving location-specific knowledge will scale back the overall variety of messages? [4] Presents a technique to develop an Associate in Nursing optimum itinerary for a mobile agent to satisfy the mixing task whereas overwhelming minimum quantity of resources, together with time and power. [6] Agent-based rule and implements a demand-based protocol that gives economical routing at the applying layer. A signal of thoughtful implementation has been developed mistreatment Aglets and simulated to gauge its performance.

III. Dynamic Source Routing (DSR)

The Dynamic supply Routing (DSR) protocol may be an easy and strong routing protocol designed specifically to be used in multi-hop wireless ad-hoc networks of mobile nodes. The Dynamic supply Routing protocol (DSR) is predicated on supply routing, which suggests that they conceive of every packet determines Associate in Nursing ordered list of nodes through that the packet should pass whereas traveling to the destination. The DSR protocol consists of 2 basic mechanisms: Route Discovery and Route Maintenance. [16]

A. Route Discovery:

Route discovery is employed only if a supply node makes an attempt to send a packet to a destination node and doesn't already apprehend a route thereto. To initiate the Route Discovery, the supplied node transmits a "Route Request" with a singular ID as one native broadcast packet. Once some intermediate node receives this Route Request, initially it determines whether or not it's seen the Route Request or not. If the node has already seen the Route Request earlier, it'll discard the packet; otherwise it'll check its Route Cache whether or not there's a route to the destination of the packet. If it's the route to focus on in its routing cache, it returns a "Route Reply" to the leader of the Route Discovery, giving a duplicate of the accumulated route record from the Route Request; otherwise it transmits the Route Request till the Route Request is received by the target.

B. Route Maintenance:

DSR protocol implements the route maintenance mechanism whereas act the packets from supply to destination. However once the communication link between the supply and therefore the destination is broken as an alternative a change in the constellation is detected. It'll cause failure of the communication between supply node and destination node. During this state of affairs DSR protocols uses the route mechanism, to sight the other doable celebrated route towards the destination to transmit information, if the route maintenance fails to search out another celebrated route to determine the communication then it'll invoke the route discovery to search out the new route to the destination.

C. Advantages and downsides of DSR:

- a) Routes maintained solely between nodes that require speaking.
- b) Route caching will additional cut back route discovery overhead.
- c) A single route discovery might yield several routes to the destination, owing to the intermediate node replying from native caches.
- d) Packet header size grows with a route length owing to supply routing.
- e) Flood of route requests might probably reach all nodes within the network.
- f) Potential collisions between route requests propagated by neighboring nodes.

D. Drawback of DSR:

Intermediate-Node Replies – once a route request packet is detected by a node that's not the destination itself, however incorporates a route to the destination in its cache, a route reply packet is distributed back to tell the supply of the route. Intermediate-Node ripples create the route learning method quicker as a result of all route requests don't get to travel all the thanks to the destination if one in every of the intermediate nodes already has the specified route. They conjointly cut back the quantity of RREQs transmitted. However, the disadvantage with Intermediate-Node replies is that the route within the intermediate node might be willy-nilly previous once the route request is detected. Hence, the supply has no guarantee of the validity of a route even instantly once the route reply is received. In a very extremely mobile network, intermediate-node replies area unit terribly doubtless to be invalid. Once a supply receives a foul route reply, it tries to send the waiting information packet on the route. Upon failure of 1 of the links on the route, a route error packet is propagated back to the supply. The supply then problems a brand new route request, beginning the method everywhere once more. So, Associate in Nursing invalid route reply from Associate in Nursing intermediate node is terribly pricey in terms of your time and information measure.

IV. Mobile Agent

Mobile agent's square measure autonomous programs that may travel from laptop to laptop with a very network, from time to time and to places of their own selecting. The state of the running program is saved, by being transmitted to the destination. The program is resumed at the destination continued its process with the saved state. They'll offer a convenient, efficient, and a sturdy framework for implementing distributed applications and good environments for many reasons, as well as enhancements to the latency and information measure of client-server applications and reducing vulnerability to network disconnection. In fact, mobile agents have many blessings within the development of varied services in good environments additionally to distributed application:

A. *Reduced communication costs:*

Distributed computing desires interactions between totally different computers through a network. The latency and network traffic of interactions typically seriously have an effect on the standard and coordination of 2 programs running on totally different computers. If one amongst the programs could be a mobile agent, it will migrate to the PC the opposite is running on communicating with it regionally. That is, mobile agent technology allows remote communications to control as native communications.

B. *Asynchronous execution:*

After asynchronous execution migrating to the destination-side laptop, a mobile agent doesn't need to act with its source-side laptop. Therefore, even once the supply is often clean up or the network between the destination and supply are often disconnected; the agent will continue processing at the destination. This can be helpful at intervals unstable communications, as well as wireless communication, in good environments. [17]

C. *Direct manipulation:*

A mobile agent is regionally dead on the PC it's visiting. It will directly access and manage the instrumentality for {the laptop the PC} as long because the computer permits it to try and do therefore. This can be useful in network management, particularly in sleuthing and removing device failures. Putting in a mobile agent near a period of time system could forestall delays caused by network congestion.

D. *Dynamic-deployment of software:*

Mobile agent's square measure helpful as a mechanism for the preparation of computer code, as a result of they'll decide their destinations and their code and knowledge are often dynamically deployed there, solely whereas they're required. This can be helpful in good environments, as a result of them contains computers whose machine resources square measure restricted.

E. *Easy-development of distributed applications:*

Most distributed applications contain a minimum of 2 programs, i.e., a client-side program and a server aspect program and sometimes spare codes for communications, as well as exceptional handling. However, since a mobile agent itself will carry its info to a different laptop, we are able to solely write one program to outline distributed computing. A mobile agent program doesn't need to outline communications with alternative computers. Therefore, we are able to simply modify standalone programs as mobile agent programs.

V. Conclusion

Basically, we develop an intelligent mobile agent, which improves the performance of the routing algorithm. This autonomous agent coordinates the gathering of information by integrating, planning, scheduling, and making decision procedures with other agents through different modules that operate differently. In addition, a comparison study is carried out based on the performance of the Dynamic Source Routing (DSR), and Distance Vector Routing (DVR). Hence we will be proposing a method provides an efficient mechanism for service differentiation and provides quality of service to the MANET.

VI. References:

- [1] David B. Johnson David A. Maltz Josh Broch "DSR: The Dynamic Source Routing Protocol for Multi-Hop Wireless Ad Hoc Networks",
- [2] A. Ferreira · A. Goldman · J. Monteiro "Performance Evaluation of Routing Protocols for MANETs with Known Connectivity Patterns Using Evolving Graphs", Wireless Networks Volume 16 Issue 3, April 2010 Pages 627 – 640
- [3] V.E Mujica-V, Y. Rebahi, D. Sisalem, R. Popescu-Zeletin, "Performance Comparison of the Neuron Routing Algorithm for Mobile Ad Hoc Networks",
- [4] Hairong Qi and Feiyi Wang "Optimal Itinerary Analysis of Mobile Agents in Ad Hoc Wireless Sensor Networks", University of Tennessee 2007.
- [5] Kenji Tei, Nobukazu Yoshioka, Yoshiaki Fukazawa, Shinichi Honiden "Using Mobile Agent for Location-Specific Data Retrieval in Manet" Intelligence in Communication Systems IFIP: The International Federation for Information Processing Volume 190, 2005, pp 157-168

- [6] Lei Liang and Peter Graham “Assessment of a Mobile Agent Based Routing Protocol for Mobile Ad-hoc Networks” AINAW '07 Proceedings of the 21st International Conference on Advanced Information Networking and Applications Workshops - Volume 01 Pages 1-5.
- [7] David B. Johnson David A. Maltz Josh Broch “DSR: The Dynamic Source Routing Protocol for Multi-Hop Wireless Ad Hoc Networks”, In Ad Hoc Networking, edited by Charles E. Perkins, Chapter 5 2001.
- [8] Ichiro Satoh “Mobile Agents”, <http://www.informatik.unirier.de/~ley/pers/hd/t/Tian:Ruya.html>
- [9] Y. Rehab and V. E. Mujica-V., “A reputation-based trust mechanism for ad hoc networks,” in Proceedings of the Tenth IEEE Symposium on Computers and Communications, Cartagena, SPAIN, June 2005.
- [10] D. Johnson and D. Maltz, “Dynamic source routing in ad hoc wireless networks,” in Mobile Computing, Imielinski and Korth, Eds. Kluwer Academic Publishers, 1996, vol. 353. [Online]. Available: citeseer.nj.nec.com/johnson96dynamic.html
- [11] U. Berkeley and U. ISI, “The network simulator NS-2,” 1998, available from <http://www.isi.edu/nsnam/ns>.
- [12] Z. Hass and M. Pearlman, “The performance of query control schemes for the zone routing protocol,” in IEEE/ACM Transactions on network-ing, vol. 9 N4, Aug. 2001, pp. 427–438.
- [13] C. Perkins, E. Royer, S. Das, and M. Marine, “Performance comparison of two on-demand routing protocols for ad hoc networks,” in IEEE Personal Communications, vol. 8 N1, February 2001, pp. 16–28.
- [14] J. Broach, D. Maltz, D. Johnson, Y. Hu, and J. Jetcheva, “A performance comparison of multi-hop wireless ad hoc networks routing protocols,” in Fourth annual ACM/IEEE international conference on Mobile computing and networking. ACM Press, 1998, pp. 85–97.
- [15] C. Perkins and M. Royer, “Ad-hoc on-demand distance vector routing,” Proc. 2nd IEEE Workshop. Mobile Comp. Sys. And Apps., pp. 90–100, Feb.1999.
- [16] 2011 International Conference on Information and Network Technology IACSIT Press, Singapore 131.
- [17] National Institute of Informatics, 2-1-2 Hitotsubashi, Chiyoda-Ku, Tokyo 101-8430, Japan.