

A Survey on Comparison and Assessment of Network Location Based Protocol

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Abstract

Mobile Ad-hoc Networks (MANETs) have built the measurement in field of remote systems. It permits any number of hubs to speak with each other without brought together support. Routing protocols used in MANET need to confront numerous difficulties because of progressively evolving topologies, route discovery, device discovery, bandwidth constrained, low transmission power and asymmetric links. Mobile ad-hoc network is a developing field for research and development of wireless network. MANETs are self-organizing, infrastructure less, independent, dynamic topology based; open and decentralized networks. The scope of this paper is to compare location based routing protocols in MANETs are ALARM, ALERT, A02P, A3RP and APPR.

Keywords: Mobile Ad-Hoc Network(MANET), Anonymous Location-Aided Routing in Suspicious (ALARM) , An Anonymous Location-Based Efficient Routing Protocol (ALERT) , Ad Hoc On-Demand Position- Based Private Routing Protocol (A02P) , Anonymous Privacy-Preserving Routing in Location based Dynamic Ad-Hoc Networks (APPR)

I. INTRODUCTION

Location Based routing Protocol are used in wireless sensors Network in which the information about the location of nodes is used for communication. These protocols reduce the energy consumption and increase the lifetime of the network.

A mobile ad hoc network (MANET) is designed for small groups of people with same special interests who want to communicate through their available devices like laptops or cell phones to share their ideas easily, quickly, and with minimum requirements. A Mobile Ad-Hoc Network (MANET) is a collection of wireless mobile nodes forming a temporary network without using any centralized access point, infrastructure, or centralized administration. MANET is an emerging, exciting and important technology these days due to the fast growth, enhancement in wireless devices. A MANET is an assortment of wireless mobile nodes and these nodes allow to forward packet and to communicate beyond their range of direct wireless transmission. MANET is self-arrange and decentralized networks or infrastructure less network. Nodes are free to move independently and change its links with other devices or nodes frequently. MANET provides a routable process for exchange of packets from one node to another, because of there is wireless networking environment.

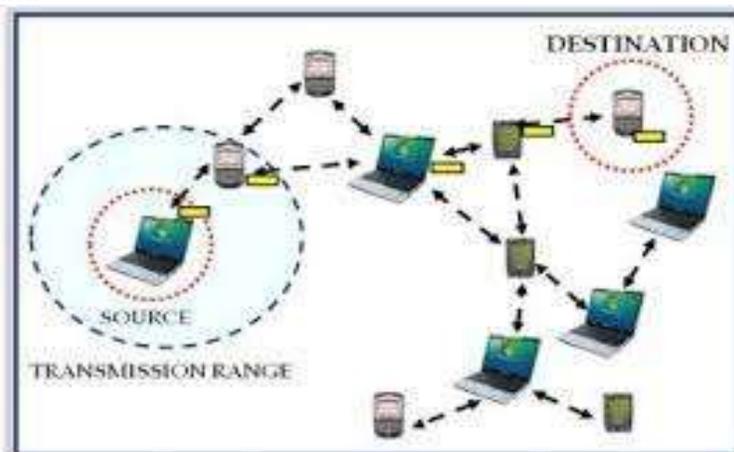


Fig. 1: Mobile Ad-hoc Network

Ad-hoc network is basically consists of Ad-hoc and network in which the word 'Ad-hoc' is a Latin word specifies the meaning 'for this' or 'for this only' and the word network specifies a set of computers mobile nodes connected via wired or wireless link. It is decentralized type of wireless network. The network is ad-hoc because it does not rely on a preexisting infrastructure, such as routes in wired network or access points in managed wireless networks.

II. LITERATURE SURVEY

A. ALARM: Anonymous Location-Aided Routing in Suspicious MANETs

This paper was presented by Karim El D efrawy, Member, IEEE, and Gene Tsudik, Senior Member, IEEE and it provides both security and privacy features, including node authentication, data integrity, anonymity, and intractability (tracking-resistance). It also offers protection against passive and active insider and outsider attacks.

B. ALERT: An Anonymous Location-Based Efficient Routing Protocol in MANET

This paper was presented by Haiying Shen, Member, IEEE, and Lianyu Zhao, Student Member, IEEE and it dynamically partitions the network field into zones and randomly chooses nodes in zones as intermediate relay nodes, which form a no traceable anonymous route. ALERT offers anonymity protection to sources, destinations, and routes. It has strategies to effectively counter intersection and timing attacks.

C. AO2P: Ad Hoc On-Demand Position- Based Private Routing Protocol

This paper was presented by Xiao in Wu and Bharat Baraga, Fellow, IEEE and it privacy is needed in ad hoc networks. An ad hoc on-demand position-based private routing algorithm, called AO2P is proposed for communication anonymity. Only the position of the destination is exposed in the network for route discovery. To discover routes with the limited routing information, a receiver contention scheme is designed for determining the next hop. Pseudo identifiers are used for data packet delivery after a route is established.

D. A3RP: Anonymous and Authenticated Ad Hoc Routing Protocol

This paper was presented by Jung Ha Paik, Bum Han Kim, Dong Hon. Lee, Annam-dong, Sungbuk-Gu, Seoul 136-701, Korea and it talk about the anonymous routing protocol furnishing authentication in the mobile ad hoc network. This protocol supports these anonymity properties which should be provided in ad hoc network and authentication is also provided by group signature for both nodes and packets during route discovery phase

III. ROUTING PROTOCOL

Routing protocols is a set of rules that governs the journey of message packets from source to destination in a network. In MANET, there are different types of routing protocols:

- 1) Table Drive /Proactive Routing Protocol
- 2) On Demand /Reactive Routing Protocol
- 3) Hybrid Protocol
- 1) Table Drive/Proactive: Routing tables are maintained by each node, which stores information of next hops/subnet. All nodes keep on updating these tables periodically.
- 2) On demand routing protocol: Establishes route to the destination only when the need arises. Periodically transmission of topological information of the network is not needed
- 3) Hybrid routing protocol: is combination of both proactive and reactive routing protocols to balance the delay.

IV. LOCATION BASED ROUTING PROTOCOL IN MANETS

They are different location based routing protocol in MANETS

- 1) ALARM: Anonymous Location-Aided Routing in Suspicious MANET
- 2) ALERT: Anonymous Location-Based Efficient Routing Protocol in MANETS.
- 3) A02P: Ad Hoc On-Demand Position-Based Private Routing Protocol.
- 4) A3RP: Anonymous and Authenticated Ad Hoc Routing Protocol.
- 5) APPR: Anonymous Privacy-Preserving Routing in Location based Dynamic Ad-Hoc Networks.

A. Alram:

ALARM addresses a number of issues arising in location-based MANET settings by designing and analyzing a privacy-preserving and secure link-state based routing protocol (ALARM).

1) Alarm Protocol

The basic steps in ALARM's operation are as follows:

- 1) Initialization (Offline).

- 2) Operation(Online)
- 3) Forensics (Optional, offline)

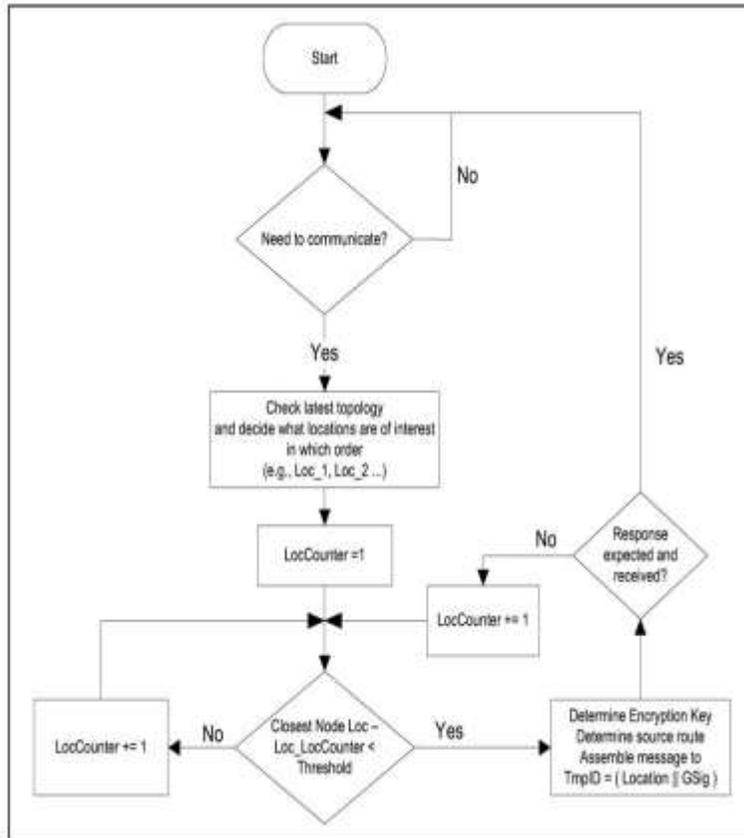


Fig. 2: ALARM data communication chart

B. AO2P:

AO2P works in the network with high node densities, the positions of destinations are the only position information disclosed in the network for routing. A route is done by delivering a routing request message from the source towards the position of the destination

1) AO2P Routing Algorithm

A secure position service system is necessary for privacy preservation in positioning ad hoc routing algorithms, it describe the proposed anonymous routing algorithm, the details on AO2P route discovery and maintenance are given, we present a receiver classification scheme, followed with the receiver contention scheme. AO2P can process efficient route discovery.

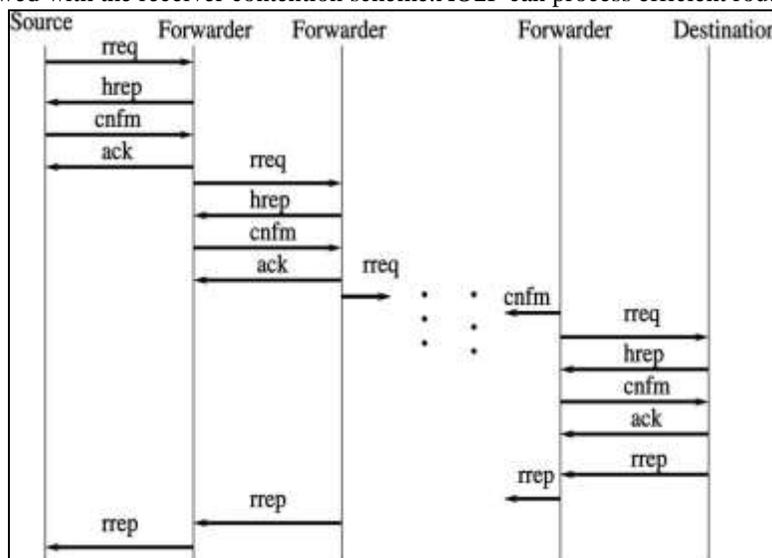


Fig. 3: Message flowchart in AO2P

C. A3RP:

The anonymous routing protocol furnish authentication in the mobile ad hoc network. This protocol supports these anonymity properties which should be provided in ad hoc network.

Group Signatures: In the group signature scheme, each group member can generate its own signature by its own private key issued from TA (trust authority). Each member can verify signature without the signer's identity. Group signature scheme provides the authentication without disturbing the anonymity.

D. APPR: Anonymous Privacy-Preserving Routing in Location based Dynamic Ad-Hoc Networks

Privacy-preserving routing in ad hoc networks require stronger privacy protection. A number of anonymous routing schemes have been proposed for ad hoc networks, and they provide different level of secure protection at different cost. Privacy protection of mobile ad hoc networks is more demanding than that of wired networks due to the open nature and mobility of wireless media.

V. COMPARISON OF ALL LOCATION BASED ROUTING PROTOCOL

Parameter	ALARM	ALERT	A02P	A3RP
1) Group Signature	Used in group signature	-	-	Used in group signature
2) Models	Active, Passive And Outsider	Random way point model and group mobility model	-	-
3) Algorithm	Initialization, Operation and Forensics	Dynamic and unpredictable routing path	Position Management, Receiver Classification, AO2P Routing Protocol	-
4) Security Analysis	Outsider Attacks, Passive Insider Attacks	-	-	Authentication, Denial of Service

Applications are as follows:

- 1) Military: It allows the military to take advantage of technology to maintain an information network between the soldiers, vehicles and military information headquarters.
- 2) Rescue Operation: It can be used in emergence/rescue operation for disaster relief efforts.
- 3) Classroom and conference: It can autonomously link an instant and temporary multimedia network using notebook computers to spread and share information among participants.
- 4) Personal Area Network: is short-range localized network where nodes are usually associated with a given person

VI. CONCLUSION

This paper describes the different location based routing protocols according to the routing strategy. We discussed some important application of MANETS routing protocol such as ALARM, ALERT, A3RP, A02P and APPR. The work is to compare the different location based routing protocol and propose an expansion of the existing routing protocol which will be better as far as security, throughput and nature of administration.

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