

# A REVIEW ON SECURITY & ENERGY EFFICIENCY IN ROUTING PROTOCOLS IN MANETs

Abhishek Kumar<sup>1</sup>, Sachin Kumar<sup>2</sup>,

Guru Ram Das Institute of Management & Technology, Dehradun, India-248001

<sup>1</sup>[abk.engg13@gmail.com](mailto:abk.engg13@gmail.com)

<sup>2</sup>[sachin.4u25@gmail.com](mailto:sachin.4u25@gmail.com)

**Abstract**— In this paper, the objective is to present a review of security & energy efficiency in routing protocols in adhoc networks. In MANETs, the mobile nodes are connected through a wireless medium forming rapidly changing topologies. Due to dynamic behaviour of the MANETs as well as limited range of transmissions, the attackers can attack easily to the networks. So, when designer implement a routing protocols, the security and energy efficiency is the first priority for the designer. In this paper, we discuss routing protocol and challenges and also discuss security & energy efficient routing algorithms for MANETs.

**Keywords**- SECURITY, ENERGY EFFICIENCY,, WIRELESS NETWORKS PROBLEMS, ROUTING, MANETs.

## INTRODUCTION

Adhoc wireless networks are self-contour, self-governing systems and distributed network where mobile nodes are connected together by wireless link without any infrastructure like base station, fixed link, routers, and centralized servers. In such a networks data can be transmitted by intermediate nodes which are not in the fixed location. Mobile ad hoc networks are based on a set of nodes which randomly communicate with each other over a wireless medium. The topology of mobile ad hoc network is not static and depends upon the mobility of the nodes so it can adjust rapidly and suddenly [1]. Routing in Adhoc wireless network is much more composite than routing in conventional networks, so the routing in adhoc networks is an important problem. To overcome this routing problem routing protocols are used for determining an efficient route. There are some approaches for routing process like proactive (Table Driven Protocol) and reactive (On Demand) approach. Proactive protocols can be exploited

for comparatively static networks & Reactive protocols perform well when mobility of nodes in the networks increases [2]. Reactive protocols (DSR, AODV, and OLSR) are suited for smaller networks [3] & while Proactive protocols (TORA, LANMAR, ZRP) are suitable for larger networks [4]. Adhoc Routing Protocols.

PROTOCOLS	EXAMPLES
REACTIVE PROTOCOLS	Adhoc On-Demand Distance Vector (AODV)
	Dynamic Source Routing (DSR)
	Geography Based Routing
	Cluster Based (Hierarchical) Routing
PROACTIVE PROTOCOLS	Destination Sequenced Distance Vector (DSDV)
	Optimized Link State Routing (OLSR)

**Table 1:** Classification of routing protocols

## SURVEY OF ENERGY EFFICIENT ROUTING PROTOCOLS

We know that the Adhoc Wireless networks is a infrastructure less networks and nodes are powered by batteries & due to limited energy of the batteries the adhoc networks don't work for long time that means the

lifetime of the networks effected. There are so many energy efficient protocols which are used for increases the lifetime of the networks. Some of them are as follows:

**I. POWER-AWARE ROUTING (PAR) PROTOCOL**

Power Aware Routing (PAR) protocol are used for maximizes the lifetime of the Adhoc Wireless Networks & reduces the unnecessary power consumption by choosing less congested and more stable route between source & destination during route establishment process [5].

**II. LOCALIZED ENERGY-AWARE ROUTING (LEAR) PROTOCOL**

LEAR Protocol 30-40 % better than DSR (Dynamic Source Routing) [12] and foremost protocol to search balanced energy consumption where routing algorithms, dynamic behavior of networks & radio propagation are all take into the accounts [6].

**III. CONDITIONAL MAX-MIN BATTERY CAPACITY ROUTING (CMMBCR) PROTOCOL**

CMMBCR Protocol suggests the idea of a threshold to extend the life of the Adhoc Wireless Networks. The idea is that, when possible routes between a source-destination pair have bigger remaining battery energy than the predefined threshold level, then optimal route is chosen by the help of minimum power among all possible routes [7].

**IV. POWER AWARE MULTIPLE ACCESS (PAMAS) PROTOCOL**

This Protocol makes the decisions on the bases of On Demand. The function of Power Aware Multiple Access Protocol is same as AODV (Adhoc On-Demand Distance Vector) [13] except the concept of turning off radios. That means, PAMAS protocol preserve the energy by turning off radios, when the nodes are not in practice. This protocol certifies the benefits at big traffic but it is not good for high mobility scenarios [8].

**V. GEOGRAPHIC ADAPTIVE FIDELITY (GAF) PROTOCOL**

The main advantage of this protocol its ability to consume 40 % to 60 % less energy as compared to other adhoc routing protocols. This protocol firstly

identifies the nodes which are important for routing perspective and turned off all remaining unnecessary nodes [9].

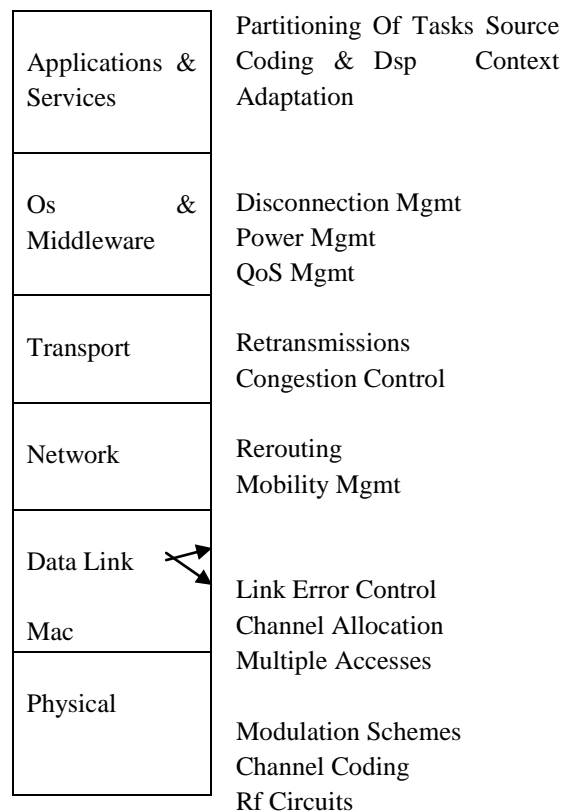


Figure1. Protocol stack of a generic wireless network, and corresponding areas of energy efficient research.

**SECURITY GOALS FOR AD HOC WIRELESS NETWORKS**

Security & Energy management play important role in MANETs. Routing Protocols is secured when more overhead provided for routing but more overheads decreases the QOS of the networks [10]. Considered the following security services by the help implement the secure routing protocol:

▪ **AVAILABILITY**

It guarantees survivability contempt Denial of Service (DOS) attacks. Attacker can attacks by using jamming techniques on the networks to interrupt the communication on physical channel. In this security

goal, analyses the routing protocols in jamming conditions.

#### ▪ CONFIDENTIALITY

This service assures that important data/information be never discovered to unauthorized users, and by using the different Encryption methods confidentiality achieved.

#### ▪ INTEGRITY

Integrity assures that the data transmitted from source to destination is never corrupted. Data/Information can corrupt due to channel noise or malicious attacks, & if data is corrupted then this service provides information about that corrupted msg. to the source.

#### CONCLUSION

The function of each routing protocols are different according to their usage and also difficult to compare them, these protocols have some strengths & some drawbacks. According to the study, one protocol can't be a result for a secure and energy efficient routing, but every protocol is implemented to provide the maximum requirements according to required services.

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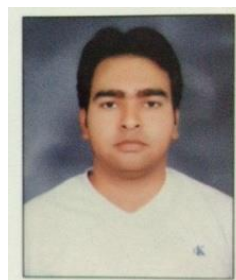
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#### AUTHORS



Abhishek Kumar presently lives in Dehradun and completed his Graduation as a B.Tech. Graduate in the field of Electronics and Communication from Gautam Budh Technical University, Lucknow, UP, India in 2011. He is post-graduate scholar in the field of Wireless & Mobile Communication from Guru Ram Das Institute of Management & technology, Dehradun, Uttarakhand, India in 2014. Presently he is working on 'Smart Antenna based energy efficient ad-hoc wireless networks'.



Sachin Kumar presently lives in Dehradun and completed his Graduation as a B.Tech. Graduate in the field of Electronics and Communication from Rajasthan Vidyapeeth University, Jaipur, Rajasthan, India in 2011. He is post-graduate scholar in the field of Wireless & Mobile Communication from Guru Ram Das Institute of Management & technology, Dehradun, Uttarakhand, India in 2014. Presently he is working on 'Study and analysis of routing protocols in wireless mesh network under nodes movements'.