iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** II **Month of publication:** February 2022

DOI: https://doi.org/10.22214/ijraset.2022.40439

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue II Feb 2022- Available at www.ijraset.com

A Study of Developments in the Routing Protocols in the Wireless Ad Hoc Networks (WANET)

Sauood Yaqoob[1], Er Jasdeep Singh[2]
[1]*Research Scholar, M.Tech CSE, Department of CSE, RIMT University, Mandi Gobindgarh,*
[2]*Assistant Professor, Department of CSE, RIMT University, Mandi Gobindgarh, Punjab, India*

Abstract: ***A mobile ad hoc network (manet) is a new name for an obsolete system: a network that doesn't require any pre-existing architecture to function. in the early 1970s, the darpa pr net and suran Programmes were predecessors of this system. the new twitch is the application of this approach in non-military communication circumstances. in addition, the research in this field has recently focused on various advanced aspects of this technology, such as multicasting and security. there have also been a number of unique solutions to "traditional" routing and medium access control problems proposed. this study attempts to characterize the state-of-the-art of networks technology in four areas: routing, intermediate identity management, multicasting, and security. when possible, reviews of the proposed techniques are offered.***

As part of this research, the Fuzzy based Flexible Energy Efficient Routing protocol (FIE2R) will be presented as a routing system for WANET. The decision maker is in charge of the whole FIE2R procedure, which is separated into two parts. It is the WANET graph start phase, which aids in the second phase's determination of each route's reward.

That's from a comprehensive computation of FIE2R using MATLAB and NS2 and a comparative analysis of the same with other networking schemes, the recommended protocol improves performance in terms of energy consumption.

Keywords: Adhoc networks, Manet, Wanet, MATLAB. Routing schemes

I. INTRODUCTION

More mechanical breakthroughs in connectivity are predicted as the world seeks towards a faster and more efficient medium of expression, leading to a more seamless manner of information transmission. Wireless adhoc networks are also crucial in satisfying the public's communication needs. WANET (Wireless Adhoc Network) is a sort of local area network that is constructed on the fly to provide continuous conversation between multiple or more continuous or discontinuous devices. Because the devices linked may directly access the information of every other component of the system via point-to-point wireless systems, the devices interact in a distributed network..

Several research suggest multiple types of sub routing to deal with the issue of power usage in sensor systems due to their battery power and failure to concentrate solely on providing an adequate configuration; this one type of data transfer was evolved by the author Raj, Jennifer S., and colleagues [1]. who fixated identifying and developing a routing that includes a comprehensive power usage and web proper utilization, and used based algorithm and CNN in making a proper route to the destination, but failed to focus on the security of data sent from the photomultiplier tube to the iiot schema, and Manshahia, et al [2] carried a similar energy efficient data spread, but the researcher conducted the routing for the wireless link using swarm intelligence, and

The development of routing capability, which is critical for basic network functions, is one of the most difficult challenges in vanets. Because of some unique subsets of variables, transit in ad hoc networks is fascinating. To begin with, nodes in an ad hoc network are free to move around. The network became extraordinarily dynamic as a result of this node motion, with frequent network dynamics and route failures.

An efficient routing protocol in this network setting must dynamically adapt to the changing network architecture. Second, the base transceiver has a substantially smaller and more variable band width than wired networks. The usage of the wireless transmitter as a shared media substantially limits the amount of bandwidth available per node. As a result, relays should be cost efficient, with a minimal staff for generating routes, so that the extra broadband may be used for data transmission. Third, nodes are powered by electricity, which have a limited capacity. In order for nodes to stay and communicate for long periods of time, a routing protocol should be energy efficient. Another reason for keeping overheads low seems to be this. Routing systems must fulfil the appealing goals of dynamic flexibility and minimum latency to obtain great overall performance.. Routing protocols developed for wired networks, such as the wired Internet, are inadequate since they rely heavily on lead topology and have significant overheads. As a result, numerous routing ideas tailored to ad hoc networks have been created.

©IJRASET: All Rights are Reserved

While some of these theories are enhanced implementations of wired network techniques, the majority of them employ innovative notions such as on-demand routing, in which routes are only retained "reactively" when they are required. Standard Internet-based protocols, on the other hand, are proactive. Other innovative paradigms, such as leveraging routing location information and energy-efficient routing, have emerged as well. In all of our discussions here, the underlying network design may be thought of as an undirected graph. Because unidirectional links may occur, this notion may not hold true in reality.

This occurs frequently when the transmission powers of the network's nodes differ. Wireless channel distortion can be spatially diverse even in a perfectly homogenous network, resulting in link advantages. Nonetheless, empirical [38] and theoretical [3] evidence shows that adopting continuous networks for routing may not be beneficial. Using such connections, on the other hand, takes time and may result in higher prices. Setting aside unidirectional links when they do exist, on the other hand, is a straightforward issue. This may be accomplished with simple two-way message exchanges between neighbouring nodes. Such signals (also known as "beacons" or "hello" messages) are regularly sent by several routing systems to locate the neighborhood node set (neighbour discovery).

Because the nodes are powered by limited-capacity batteries, ADhoc is an extremely busy and dispersed species. As a result, creating energy-efficient routing protocols is a massive undertaking. Energy supply is one of the most crucial limits for the ad-hoc network's operation since various energy sources have a finite lifespan. Energy is consumed by an adhoc network node from a variety of sources. Forwarding a packet, received a packet, the node in waiting state, and the router in deep sleep, which occurred when the node's wireless network is turned off, have all consumed energy. The capacity of a node to relay packets on behalf of others is affected by its power failure, as is the network's overall lifetime. As a consequence, adopting routes that need a couple of miles and average rating rather than alternatives that require a long duration and little energy is what energy efficient routing includes.

As a consequence, nodes should pick the optimal path depending on its remaining lifespan in order to optimise network performance. The remaining lifespan route cannot be computed in a systematic manner since the factors that impact route lifetime are variable.

The framework of the recommended protocol, which is based on two fundamental input factors such as energy and distance, may be evaluated utilising intelligent fuzzy logic methodologies in this scenario. These two parameters help to start multiple implications, which are then sent into the inference engine, which processes the many rewards connected with each path. It has been found that the proposed routing protocol adds to performance gains based on simulations and a comparison of the proposed routing protocol to other current protocols.

II. LITERATURE REVIEW

Gil Zussman and Adrian Segall [11] proposed using an adhoc network of wireless smart tags to gather information from imprisoned survivors. The authors investigate the energy-efficient routing conundrum in such a networks, demonstrating that "clever badges" have limited power sources and slow data rates, both of which are insufficient in an emergency. The purpose of this task is to maximise the length of time before the first battery runs out, much like any other cast routing issue.

Yu et al. [12] investigates and categorises the proposed MANET energy-aware routing algorithms. They lower the amount of continuous feedback energy needed to send and receive packets, as well as the amount of collaborative negotiation energy consumed when a mobile node stays inactive yet listens to the wireless media for any prospective specific status from other nodes. The findings are divided into two groups by the authors.

Transmission power control and load distribution fall into the first category, whereas sleep/power-down mode falls into the second. In many circumstances, it's difficult to tell which algorithm is ideal for a given situation; each protocol has its own set of advantages and disadvantages. As a consequence, the authors make it easy for scientists to integrate existing methodologies in order to produce a more energy-efficient system.

. Su et al. [13] proposed the fuzzy logic modified AODV routing (FMAR) protocol for routing process in mobile ad hoc networks. The main purpose of this system is to use fuzzy logic weighted multi-criteria to dynamically assess active routes. It also helps manage the low throughput of mobile devices. The proposed protocol, however, has a problem in that it does not create rating values for all feasible routes; instead, it chooses one, making it difficult to determine which paths are the most useful. However, none of the aforementioned methods address the issues of energy-efficient routing and network longevity based on variables such as energy and distance. As a consequence, both of these challenges are taken into account in the recommended methodology, which is based on two parameters.

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue II Feb 2022- Available at www.ijraset.com

III. OBJECTIVES

The goal of this study is to try comparing routing protocol in wireless hetnets in order to create a computer server that adapts to changing switches and routers instantly and is website speed cost effective by using a small amount of bandwidth for computer science routes and leaving the rest for data communication.

The goal of the routing protocol is to provide an economical path between source and destination node so that signals may be delivered to the customer. Because inter ad-hoc wireless relies on each nodes acting as a route and packet forwarder, frequency and power constraints are important considerations in today's wireless network.

The Fuzzy based Intelligent Energy Efficient Routing algorithm (FIE2R), which is a thermally saving network, is presented for WANET. The hiring manager will also be in charge of FIE2R's overall operation..

IV. METHODOLOGY

On-demand (reactive) routing is a distinct and significant departure from traditional proactive routing. The main idea behind on-demand routing is to find and keep just the routes that are needed. Always bear in mind that preemptive routing approaches track all routes, regardless of how they'll be used. The obvious advantage of on-demand route identification is that you don't have to pay for maintenance routes that aren't being used. This method is useful when congestion is unpredictable, bursty, and directed primarily toward a small number of nodes.

Because routes are established as need, data packets experience transmission delay at the source when the route is recognised at the start of class and when the connection is repaired later after a failure. Another less obvious effect on travel is that routes may become insufficient over time as they are used until they collapse under a pure on-demand protocol. In the remainder of this Section, we provide three well-known on-demand procedures, followed by a generic set of modifications that can assist those on protocol..

A. Protocols for On-Demand Routing

1) Dynamic Source Routing (DSR) [27, 28]

It's referred to as source routing. That is, the originator is aware of the participant's whole hop-by-hop journey. These routes are saved in a route cache. In data packets, the origination route is provided in the packet header.

When a node in an ad hoc network attempts to transport a data packet to a location for which it does not have a route, it uses a route to the destination to establish one dynamically. Route works by flooding the network with route request (also known as query) packets. Each node receives a request and rebroadcasts it when it is the place or has a path to a destination in its route cache.. In response to an invitation, such a node sends a route reply packet back to the introduction. Routes request and adapt to a changing are also routed using source routing. The request continues along a path that has previously been travelled. The reply to returns to the source by taking this path backward. The return route of the reply packet is saved at the origin for future use. If any communication on a source route is broken, a route error packet is generated . When a route error is sent to the source, all entries in the route caches and along path that comprises the broken link are deleted. If you choose this path,

DSR makes considerable use of source routing and route caching. Source routing provides complete route to the destination, and routing loops may be easily identified and avoided without the need of any additional processes. Because route requests and responses are both source navigated, the sender and receiver can learn and caches routes to all intermediary nodes as well as to each other. Any transmitting node in a message it transfers also caches any source route for subsequent use.. One of the DSR enhancements is slutty listening, which lets nodes who aren't collaborating in forwarding to listen in on neighbouring data transfers and discover new routes for free. To take full use of route caching, DSR answers to all requests reaching a location in a single request cycle. As a result, the source discovers a number of other routes to the destination, which will be useful if the primary (shortest) route fails. Route discovery floods, which are a common evaluation bottleneck, can be avoided by having a large number of alternate routes available. However, if caution is not maintained, a route reply deluge may ensue. The figure 1 depicts the core concept of Dynamic Source.

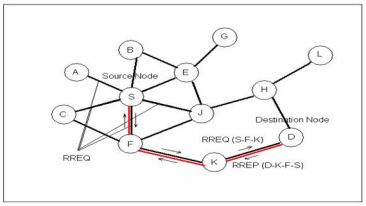


Figure 1 basic principle of Dynamic Source Routing

©IJRASET: All Rights are Reserved

On the other hand, intensive route caching has a price tag. The fundamental mechanisms for deleting stale routes in the DSR protocol are unsuccessful. Stale routes not only spend precious device on a network by forwarding traffic that are subsequently rejected, but they also contaminate caches at other nodes. Stale caches have been shown to have a significant detrimental influence on performance in various performance tests [12, 5], especially at high mobility and/or heavy loads. Further research into improved caching algorithms for DSR was prompted by these discoveries . Using source routes in data packets increases DSR's byte overhead, in addition to stale cache concerns. In a future effort, the DSR designers addressed this issue [12].

2) Ad hoc On-demand Distance Vector (AODV)

On the other hand, comprehensive route caching has a price tag. The fundamental mechanisms for deleting stale routes in the DSR protocol are unsuccessful. Stale routes not only waste precious network bandwidth by forwarding/overhearing packets that are subsequently rejected, but they also contaminate caches at other nodes. Stale caches have been shown to have a significant detrimental influence on performance in various testing process [13], especially at high mobility and/or heavy loads. Further research into improved caching algorithms for DSR was prompted by these discoveries [11, , 13]. Using source routes in data packets increases DSR's byte overhead, in addition to stale cache concerns. In a future effort, the DSR designers addressed this issue [2]..

AODV can only acquire a limited quantity of routing data with each route discovery due to the lack of source routing and promiscuous listening. AODV is also careful when it comes to stale routes. It uses routing table to assess the freshness of routing information, and nodes only keep route information for locations with the most current known hop count; older sequence numbers, even if still valid, are discarded. AODV uses a timer-based route expiration method to swiftly delete stale routes. Again, if a low time-out value is set, valid routes may be erased without need. An Example of the AODV Protocol is shown in figure 2

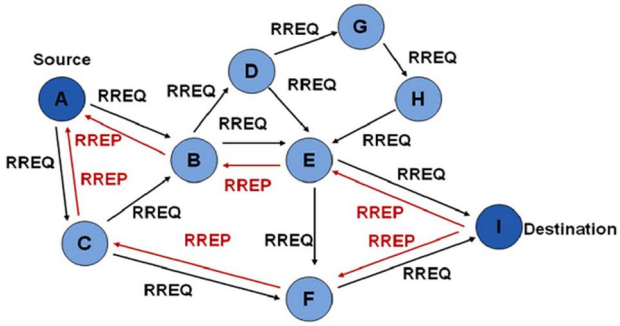


Figure 2 Example of AODV Protocol

Because each AODV node only retains one route per destination, during reactive routing, the venue only answers to the initial user requests once. Because it is a single path system, that must launch a new shortest path if the lone path from the sender to the receiver fails. When topology varies often, route discovery must be initiated frequently, which might be ineffective owing to route discovery flood's significant latency and overhead. We proposed Ad hoc On-Demand Multipath Distance Vector (AOMDV), a multipath modification of AODV [6] to address this issue Because every node in AODV only retains one routes per recipient, in route discovery, the destination only answers to the initial incoming request once. Because it is a single path system, it must launch a new route discovery if the lone path from the source to the destination fails. When topology changes regularly, shortest path must be initiated frequently, which might be inefficient owing to route discovery flood's significant latency and complexity. We proposed Ad hoc On-Demand Dynamic routing Distance Vector (AOMDV), a multipath modification of AODV [6], to address this issue.

3) Temporally Ordered Routing Algorithm (TORA) [4]

Is a different type of on-demand protocol. The reactive routing technique in TORA creates a destination-oriented directed acyclic graph by computing numerous loop-free paths to the destination (DAG).

TORA causes the links to have a logical directionality, whereas the ad hoc connection is considered as a digraph. TORA employs a route maintenance strategy that demands extensive inter-nodal coordination and is based on Gafni and Bertsekas' [12] link reversal concept for localised route failure recovery. The essential notion behind link reversal algorithms is as follows. When a link failure at a node causes the node to lose all downward links to reach the destination, a sequence of link reversals starting at that node can reverse the DAG back to a destination-oriented state ..

4) Optimizations for On-demand Routing

Several broad sense on-demand routing enhancements have been proposed, most of which are protocol-independent. The three types of optimizations accessible are flooding optimizations, stable route selection optimizations, and route maintenance optimizations. A basic review of techniques in each of these categories is provided below.

While detailing alternate approaches in the previous sections, we assumed that simple flooding is used for route finding. Using appropriate flooding strategies, however, route finding overhead can be decreased. The overall benefit is defined by the relationship between the frequency of route discovery operations, network density, and the cost of keeping up-to-date input data at each node when local neighbourhood techniques are utilised. Because the route discovery flood does not need to reach every node, understanding that it is only seeking for the destination opens up more opportunities for optimization. By conducting a restricted flood inside a tiny (relative to network size) zone that encompasses both source and destination, expanding ring search [7] and query localization [7] are two examples of approaches that take use of this. When using widening ring search, the citation tabulates the location (in hops) to the departure point and uses this distance (ring size) in the form of TTL to perform a confined flood around in the generator; if the journey search fails, the ring size is expanded recursive until the wireless infrastructure is sought or a route is found; if the route search fails, the ring size is greater recursive until the entire network is searched or a route is found.. Using the most current hop count is the easiest approach for estimating distance. In contrast, query translation is based on the idea of path proximity in both space and time. The query is limited to a few hops around the old path since it is believed that the new path and the broken old path would only differ in a few nodes; if route discovery fails, the search region is enlarged in subsequent tries.

5) Performance of On-Demand Routing

On-demand procedures have a well-established track record. TORA is the least successful of the three therapies we've looked at, according to specific empirical performance outcomes in the literature [5, 10]. TORA's link reversal method, while innovative, demands a lot of inter-nodal synchronisation and hence has a lot of overhead. In addition, the requirement for regular and in-order delivery puts even greater demand on bandwidth. As a result, subsequent performance studies focused only on the relative performance of DSR and AODV [50]. As per this study, DSR with caching is more acceptable at low mobility and low loads. AODV performs well in more challenging conditions with high mobility and loading.

V. SYSTEM ARCHITECTURE

Twisted logic is a term used to describe logic that is skewed in some way. Zadeh [14] created fuzzy logic as a mathematical area that uses rigorous mathematical terminology to represent human reasoning, and it became an element of fuzzy control. It's a multi-valued logic that allows you to describe values in the middle of typical evaluations such as true/false, yes/no, high/low, small/big, short/long, and so on. Concepts such as somewhat long or exceedingly long, tiny or very little, can be defined and handled mathematically. Many authors [15-18] used fuzzy logic in ad-hoc networks. FL makes it simple to get a definite judgement based on data that is confusing, imprecise, noisy, or missing. A team leader [10] is a component of the microsoft software that attempts to solve a problem by acting as if it were a human expert in a certain field. When a human expert is unavailable, non-experts are typically counselled by a decision maker. A decision maker's two main parts are an insight system and an inference engine.

The proposed work is based on fuzzy based cognitive energy efficient networking, which makes judgments with the help of a decision maker and an inference engine. This decision maker divides the entire job of the proposed procedure into two sections. The assumptions and information for each of these phases are as follows:

A. The WANET graph initiation phase

The team leader used the WANET network as a complete bipartite graph G [3], [4] to solve the intelligent energy efficient routing problem. Graph G's vertices may be separated into two subsets, Vi and Vj, with no edge having both endpoints in the same population and every feasible edge joining vertices in different subsets included in the graph. That is, it is a bipartite network (Vi, Vj, E) in which vivj is an edge in E for every two vertices vi Vi and vj Vj. A full bipartite graph with |Vi|=m and |Vj|=n divisions. The following is a description of the proposed full bipartite graph:

- G: Complete bi-partite graph of proposed system model
- V: All vertices of graph G
- E: All edges of graph G
- $Vi \in V$ where $1 \leq i \leq m$, which consider as set of different energy
- $Vj \in V$ where $1 \leq j \leq n$, which consider as set of different distance
- $Ek \in E$ where $1 \leq k \leq mn$, which consider set of link or route

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue II Feb 2022- Available at www.ijraset.com

Under ideal circumstances, data is transferred from node Vi to node Vj. The phrase "best case scenario" is a misnomer. The decision maker chooses the node with the appropriate distance and energy. There are a variety of values for these linguistic variables with enough energy and acceptable distance.

The process of deciding on a reward. Many states are possible depending on the values of m and n. Tables 1 and 2 demonstrate the many m and n combinations that are possible. As indicated in Tables 3 and 4, the values of m and n were adjusted to 6 and numerous membership functions of energy and distance were tried. The states of all possible paths are calculated using Eq (1). The value of each state's associated index is shown in Table 5.

Sij=Ratio of energy/Ratio of distance ……. (1)

Table 1 Possible combination of different energy

Very Low	Less Low	Low
EVL	ELL	EL
Medium Low	Not So Low	Medium
EML	ENSL	EM
High	Less High	Fairly High
EH	ELH	EFH
High	Very High	Extremely High
EH	EVH	EEH

Table 2 Possible combination of different distance

Very Short	Less Short	Short
DVS	DLS	DS
Medium Short	Not So Short	Medium
DMS	DNSS	DM
Long	Less Long	Fairly Long
DL	DLL	DFL
Long	Very Long	Extremely Long
DL	DVL	DEL

Table 1 Possible combination of different distance

Very Short	Less Short	Short
DVS	DLS	DS
Medium Short	Not So Short	Medium
DMS	DNSS	DM
Long	Less Long	Fairly Long
DL	DLL	DFL
Long	Very Long	Extremely Long
DL	DVL	DEL

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue II Feb 2022- Available at www.ijraset.com

Table 2 Membership function of energy

EVL	EL	ENSL
(EVLa, EVLb, EVLc)	(ELa, ELb, ELc)	(ENSLa, ENSLb, ENSLc)
(0, 0, 60)	(0, 60, 120)	(60, 120, 180)
EM	EH	EVH
(EMa, EMb, EMc)	(EHa, EHb, EHc)	(EVHa, EVHb, EVHc)
(120, 180, 240)	(180, 240, 300)	(240, 300, 300)

Table 3 Table 4: Membership function of distance

DVS	DS	DNSS
(DVSa, DVSb, DVSc)	(DSa, DSb, DSc)	(DNSSa, DNSSb, DNSSc)
(0, 0, 100)	(0, 100, 200)	(100, 200, 300)
DM	DL	DVL
(DMa, DMb, DMc)	(DLa, DLb, DLc)	(DVLa, DVLb, DVLc)
(200, 300, 400)	(300, 400, 500)	(400, 500, 500)

Table 4 State of different route

S11	S12	S13	S14	S15	S16
0.6	0.3	0.3	0.3	0.3	0.6
S61	S62	S63	S64	S65	S66
0.6	0.3	0.3	0.3	0.3	0.6

C1 S12, S13, S14, S15, 62, S63, S64, S65, C2 S11, S16, S22, S23, S24, S25, S32, S33, S34, S35, S42, S43, S44, S45, S52, S53, S54, S55, S61, S66, C3 S21, S26, S31, S36, S41, S46, S51, S66 As a result, each category has a number of duplicate states, each of which adds to the route's energy inefficiency. We utilise Eq (2) to determine the reward of each path to reduce the duplicate state, and the values of each reward are presented in Table 6.

Rij=Mean of energy/Mean of distance (2)

Table 5 Reward of each route

R11	R12	R13	R14	R15	R16
0.6000	0.3000	0.1500	0.1000	0.0750	0.0667
R61	R62	R63	R64	R65	R66
5.4000	2.7000	1.3500	0.9000	0.6750	0.6000

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

From Table 6, the sequence of the reward of the routes to be selected by decision maker as according to their non-increasing order reward values as follows:

R61> R51> R41> R62> {R31, R52}> R42> R63> {R21, R32, R53}> {R43, R64}> R54> R65> {R11, R22, R33, R44, R55, R66}> R56> R45> {R34, R46}> {R12, R23, R35}> R36> R24> {R13, R25}> R26> R14> R15> R16

Therefore, obviously, R61 (Very high energy and Very short distance) is better than R16 (Very low energy and Very long distance). And other select route as R51, R41 and R62

VI. SIMULATION RESULTS AND ANALYSIS

In this section, NS2 is used to maximize the behavior of this protocol based on deep learning environmentally friendly routing in terms of energy and distance, as illustrated in Figures 1, 2, and 3. The features of FIE2R and other contemporary protocols Flood, AODV, and FMAR are coded in fis-files and m-files using the MATLAB Fuzzy Toolkit to determine the membership functions of input-output variables and defuzzification output. We utilise a simulator to evaluate the FIE2R interface's results and evaluate it to the state and intelligence scale of other protocols' routes. We examine ad hoc networks with 100 nodes equally deployed in a 1000m X 1000m region using grid design.

In this section, NS2 is used to simulate the performance of this protocol based on intelligent energy efficient routing in terms of energy and distance, as illustrated in Figures 3, 4 and 5. The features of FIE2R and other contemporary protocols Flood, AODV, and FMAR are coded in fis-files and m-files using the MATLAB Fuzzy Toolkit to determine the membership functions of input-output variables and defuzzification output. We utilise a simulator to evaluate the FIE2R interface's performance and compare it to the state and intelligent scale of other protocols' routes. We examine ad hoc networks with 100 nodes equally deployed in a 1000m X 1000m region using grid design.

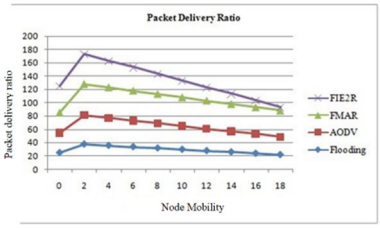


Figure 3 Packet delivery ratio vs. node mobility

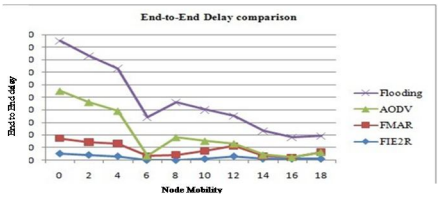


Figure4 Average end-to-end delay vs. node mobility

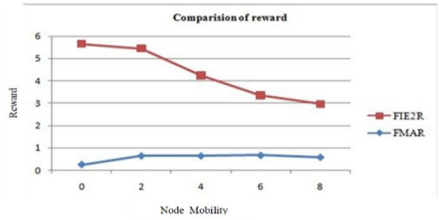


Figure 5 Comparison of reward of two protocols.

We evaluate the performance of FIE2R protocol through simulation and compare it with the state and intelligent scale of different route based on other existing protocols. And realise that AODV and FIE2R are suitable for different situations: on-demand routing protocol is preferred when the wearable computer network limits to energy supply, changes topology a lot or communications frequently, proactive routing protocol is preferred when the wearable computer network requirements high real-time.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

VII. CONCLUSION

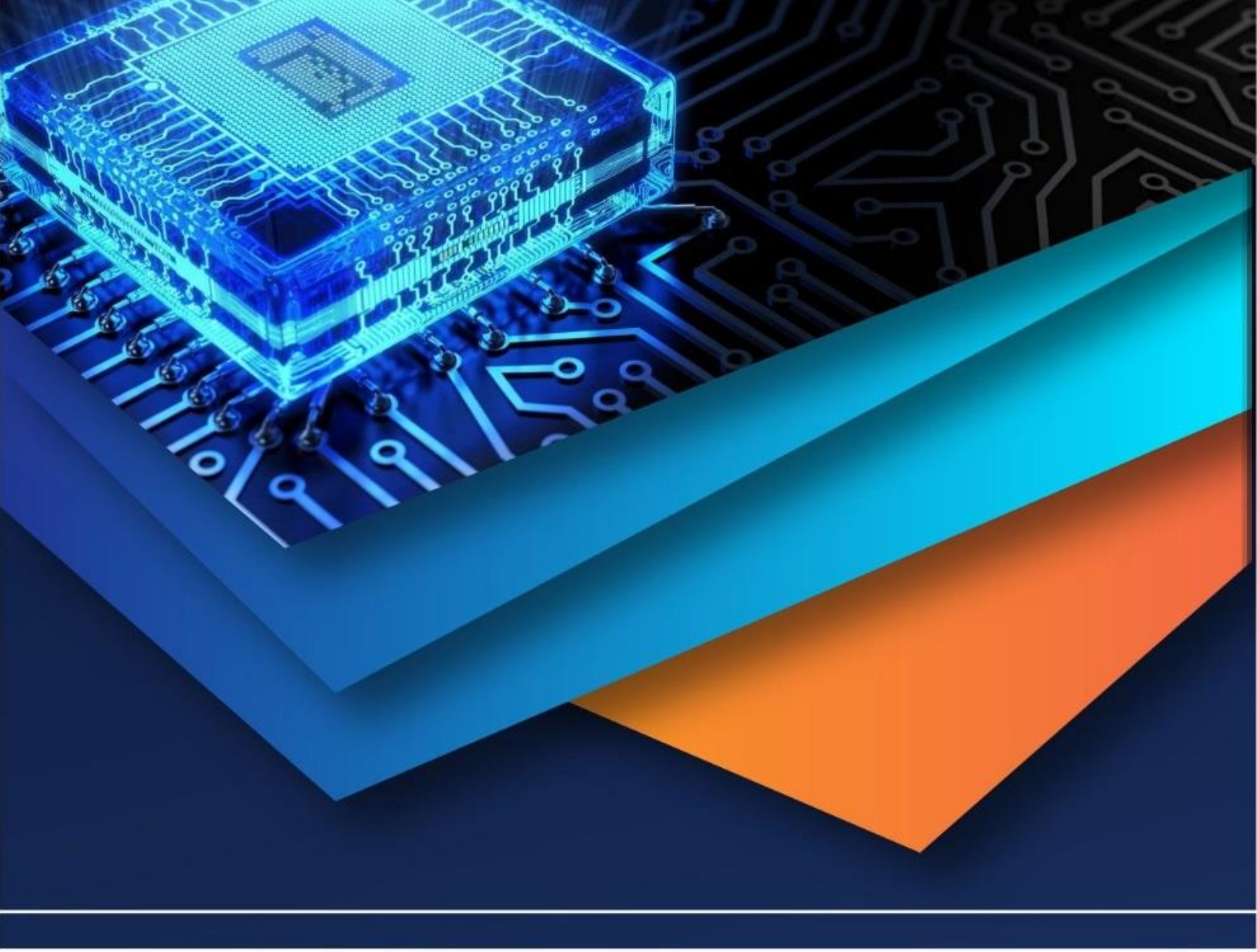
A Wireless ad hoc network (WANET) is a new name for an old technology: a network that doesn't require any pre-existing infrastructure to function. In the early 1970s, the DARPA PR Net and SURAN programmes were precursors of this technology. The adoption of this method in non-military communication circumstances is known as the new twitch. In contrast, the research community has recently focused on various advanced aspects of this technology, such as anycast and security. Countless different solutions to "traditional" routing and medium access control difficulties have also been given.

In this research while comparing the graph of Packet Delivery Ratio and End-to-End Delay we conclude that the FIE2R has maximum Packet Delivery Ratio and minimum End-to-End Delay than other protocols such As FMAR and AODV. In this study, for the WANET routing problem, we use a fuzzy base intelligent energy efficient solution. The most essential worry in mobile terminals is the routing problem, which should also be considered in all parts of networks. We argue that using fuzzy intelligence functions and operators to devise effective solutions to a variety of related energy mindful routing challenges in wireless networks is a promising area. In Particular , we come to a conclusion that that FMAR and FIE2R are suitable for different situations: on-demand routing protocol is preferred when the wearable computer network limits to energy supply, changes topology a lot or communications frequently, proactive routing protocol is preferred when the wearable computer network requirements high real-time As a result, future work will involve determining the statistic of network lifespan based on various characteristics and determining a threshold statistic for each route's rating. After a specific amount of time has passed, analyse all data to see what threshold values are best for energy efficient routing. Finally, based on the network information, select the most energy efficient routes and the next most energy efficient routes.

REFERENCES

[1] P. Jacquet, P. Mulethaler, A. Qayyum, A. Laouiti, L. Viennot, and T. Clausen, “Optimized Link State Routing Protocol,” Internet Draft, Internet Engineering Task Force, March 2001. http://www.ietf.org/ internet-drafts/draft-ietf-manet-olsr-04.txt.
[2] S. Murthy and J J. Garcia-Luna-Aceves, “An Efficient Routing Protocol for Wireless Networks,” ACM Mobile Networks and Applications, vol. 1, no. 2, pp. 183-197, 1996.
[3] G. Pei and M. Gerla, “Fisheye State Routing in Mobile Ad Hoc Networks,” Proceedings of ICDCS’2000, Taipei, Taiwan, pp. D71—D78, April 2000, Internet Draft: http://www.ietf. org / internet- drafts/drafl- ietf-manet-fsr-00.txt.
[4] C.E. Perkins and P. Bhagwat, “Highly Dynamic Destination-Sequenced Distance-Vector Routing (DSDV) for Mobile Computers,” ACM Computer Communication Review, vol. 24, no. 4, pp.234-244, 1994.
[5] D. Johnson and D. Maltz, “Dynamic Source Routing in Ad Hoc Wireless Networks,” Mobile Computing, Chapter 5, Kluwer Academic: Hingham
[6] R. Dube, C. Rais, K. Wang, and S. Tripathi, “Signal Stability based Adaptive Routing (SSA) for Ad Hoc Mobile Networks,” IEEE Personal Communication, vol. 4, no. 1, pp. 36-45, 1997.
[7] M. Jiang, J. Ji, and Y.C. Tay, “Cluster Based Routing Protocol,” Internet Draft, draft-ietf-manet-cbrp-spec-01.txt, work in progress, 1999.
[8] Z. Haas, M. Pearlman, and P. Samar, “Zone Routing Protocol (ZRP),” Internet Drafl, Internet Engineering Task Force, January 2001, http://www.ietf.org/internet-drafls/ draft-ietf-manet-zone-ierp-00.txt.
[9] S.-C. Woo and S. Singh, “Scalable Routing Protocol for Ad Hoc Networks,” Wireless Networks, vol. 7, no. 5, pp. 513-529, 2001.
[10] Azzedine Boukerche, “Performance Evaluation of Routing Protocols for Ad Hoc Wireless Networks,” Kluwer Mobile Networks and Applications, vol. 9, pp. 333-342, 2004.
[11] A. Nasipuri, R. Castaneda, and S.R. Das, “Performance of Multipath Routing for On-Demand Protocols in Mobile Ad Hoc Networks,” ACM/Kluwer Mobile Networks and Applications (MONET), vol.6, no. 4, pp. 339-349, 2001.
[12] Samir R. Das, Robert Castaneda, and Jiangtao Yan, “Simulation-Based Performance Evaluation of Routing Protocols for Mobile Ad Hoc Networks,” Baltzer, Mobile Networks and Applications, vol. 5, pp. 179— 189, 2000

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)