Impact Factor (SJIF): 4.542

International Journal of Advance Research in Engineering, Science & Technology

e-ISSN: 2393-9877, p-ISSN: 2394-2444

Volume 4, Issue 7, July -2017

A Survey: Distributed Three-Hop Routing Protocol

[1]Ms. Rutuja R. Shinde, [2]Prof. M. P. Wankhade

[1,2]Dept of Comp Engg Sinhgad College of Engineering,Punr,Maharashtra,India

Abstract--- ***Hybrid Wireless Networks have gained a lot of importance because of its ultra-high performance in today's networking world. Hybrid Wireless Networks consists of both Mobile Ad-hoc Network (MANET) and Infrastructure Wireless Networks. MANETs are infrastructreless and most probably short lived networks where mobile nodes communicate directly through peer-to-peer. Infrastructure Wireless Network requires a central point of access. As there are advantages of using these two together there are also disadvantages that leads to high overload, increase in number of hotspots, low reliability. Thus, we need routing protocols to increase the network scalability and capacity. However, these flaws will be overcome using Distributed Three-Hop Routing Protocol leading to low overhead, reduced number of hotspots and increase in reliability.***

Keywords--- MANET, Three-hop routing, Peer-To-Peer.

I. INTRODUCTION

As there are advantages of using these Mobile Ad-hoc Network and Infrastructure Wireless Network two together there are also disadvantages that leads to high overload due to route discovery and maintenance, increase in number of hotspots as mobile gateway nodes can easily be hotspots, low reliability due to long and dynamic routing paths. Thus, we need routing protocols to increase the network scalability and capacity. However, these flaws will be overcome using Distributed Three-Hop Routing Protocol (DTR) leading to low overhead, reduced number of hotspots and increase in reliability.

Distributed Three-Hop Routing protocol divides a message stream into number of segments and then transmits these segments in a distributed manner. It makes full use of widespread base stations using its high speed ad-hoc interface and reduces congestion using its cellular interface. DTR reduces the overhead by eliminating the work for route discovery and maintenance. It also avoids the overloading of the base stations.

Finally we can improve the lifetime of the network by analyzing the impact of limiting the hop count. This is done using Mixed Integer Programming (MIP) models. Well certainly limiting the number of hop counts leads to decrease in network lifetime.

However, there is a trade-off between minimizing the hop count and increasing the lifetime i.e., the decrease in network lifetime is negligible if the number of limiting the hop counts is relaxed a little bit. Example- 3 decrease in lifetime of the network is possible if the minimum hop count is increased by 15.

II. LITERATURE SURVEY

2.1 Paper Name: Cooperative Packet Delivery in Hybrid Wireless Mobile Networks: A Coalitional Game Approach [2]

Authors: Khajonpong Akkarajitsakul, Ekram Hossain, Dusit Niyato

Description: Here creators consider the matters of helpful bundle conveyance to versatile hubs amid a mixture remote portable system, where both foundations based and framework less (i.e., spontaneous mode or shared mode) interchanges are utilized. We have a tendency to propose an answer bolstered a coalition arrangement among portable hubs to turn in glove convey parcels among these versatile hubs inside a similar coalition. A coalitional amusement is created to examine the conduct of the levelheaded portable hubs for agreeable bundle conveyance. A gathering of portable hubs makes a call to append or to leave a coalition bolstered their individual adjustments. The individual result of each versatile hub might be a perform of the run of the mill conveyance delay for parcels transmitted to the portable hub from a base station and furthermore the esteem caused by this versatile hub for handing-off bundles to various portable hubs. to look out the result of each versatile hub, a Markoff procedure show is detailed and furthermore the normal esteem and parcel conveyance delay are gotten once the portable hub is amid a coalition. Since each the normal esteem and parcel conveyance delay rely on the probability that each portable hub can encourage diverse versatile hubs inside a similar coalition to forward bundles to the goal portable hub inside a similar coalition, a discussions amusement is utilized to look out the ideal serving to probabilities. At the point when the result of each portable hub is acquired, we find the arrangements of the coalitional amusement that are the steady coalitions. A conveyed algorithmic govern is gave to get the steady coalitions and a Markov-chain-based investigation is utilized to judge the stable coalitional structures acquired from the disseminated algorithmic run the show. Execution examination comes about demonstrate that once the steady coalitions are molded, the versatile hubs come to a nonzero result (i.e., utility is past the cost). With a coalition arrangement, the portable hubs achieve higher result than that once every versatile hub acts alone.

2.2 Paper Name: A Distributed Three-hop Routing Protocol to Increase the Capacity of Hybrid Networks [1]

Authors: Ze Li and Haiying Shen

Description: Hybrid wireless networks combining the benefits of each ad-hoc networks and infrastructure wireless networks are receiving more and more attentions as a result of their ultra-high performance. An economical information routing protocol is a vital element in such networks for top capacity and quantity. However, most routing protocols for the networks merely mix ad-hoc transmission mode and a cellular transmission mode, which fail to require advantage of the dual-feature design. This paper presents a distributed Three-hop Routing (DTR) protocol for hybrid wireless networks. DTR divides a message information stream into segments and transmits the segments in a very distributed manner. It makes full spatial recycle of system via high speed ad-hoc interface and mobile entry congestion via cellular interface.

2.3 Paper Name: Capacity of a Wireless Ad Hoc Network with Infrastructure [4]

Authors: Benyuan Liu, Patrick Thiran, Don Towsley

Description: In this paper we tend to examine the ability of remote surprising systems with foundation support of partner overlay of wired base stations. Such a determination is normally alluded to as cross breed remote system or multi-hop cell organize. Past examinations regarding this matter are altogether fixated on the two dimensional circle display arranged by Gupta and Kumar in their unique work on the ability of remote surprising systems. We extra consider a one-dimensional system demonstrates and a two-dimensional strip model to explore the effect of system spatiality and immaculate science on the capacity of such systems. Our outcomes demonstrate that totally extraordinary system measurements prompt extensively totally extraordinary capacity scaling laws.

2.4 Paper Name: Interference aware resource allocation for hybrid hierarchical wireless networks [5]

Authors: Preetha Thulasiraman, Xuemin (Sherman) Shen

Description: This paper tends to the matter of impedance mindful asset designation for OFDMA based half breed class-cognizant remote systems. Creators tend to create two asset designation calculations considering the effect of remote impedance requirements utilizing a weighted SINR struggle chart to measure the obstruction among the varying hubs:

(1) Impedance mindful steering misuse most synchronal stream streamlining; and

(2) Rate adaptation joint subcarrier and power assignment equation underneath impedance and QoS imperatives. We misuse spatial reprocess to dispense subcarriers inside the system demonstrate that a wise reprocess of assets will enhance yield though alleviating impedance. Creators offer an imperfect heuristic to determine the speed adaptation asset allotment downside. We tend to show that forceful unique reprocess and tweaked obstruction displaying gather benefits as far as yield, end-to-end postpone and control circulation.

2.5 Paper Name: A node-based available bandwidth evaluation in IEEE 802.11 ad hoc networks [6]

Authors: Cheikh Sarr, Claude Chaudet, Guillaume Chelius, Isabelle Guerin Lassous

Description: In this article authors proposes a substitute way to estimate the information measure on the market to wireless nodes and by extension on one-hop links in IEEE 802.11-based circumstantial networks. The technique exploits the very fact that the node will estimate the channel guests by observation its environment. It provides a non-intrusive estimation which means that it doesn't generate any further traffic to perform the analysis. Authors have a tendency to show by simulations that our technique provides associate appropriate estimation of the industry information measure on wireless links in several circumstantial configurations. However, we have a tendency to surprise conjointly a setting during which this method doesn't offer correct quotes and propose a customization of our expert boosting its preciseness in this case.

III. SYSTEM ARCHITECTURE

DTR uses at most two hops to transmit the segments to the BSes in a distributed manner, and depends on the BSes to combine the segments. Using the advantages of the infrastructure wireless network, when a source wants to send the message to the destination, DTR divides the message into number of partial segments and transmits each segment to the neighbor nodes. Neighbor nodes then decide locally between direct transmission and relay transmission based on the QoS requirement of the application. The neighbor nodes then transmit these segments to the BSes in a distributed manner. The BS further transmits these segments to the final BS where the destination node resides. The data routing process in DTR can be divided into two steps: uplink from source node to the first BS and downlink from the final BS to the destination node.

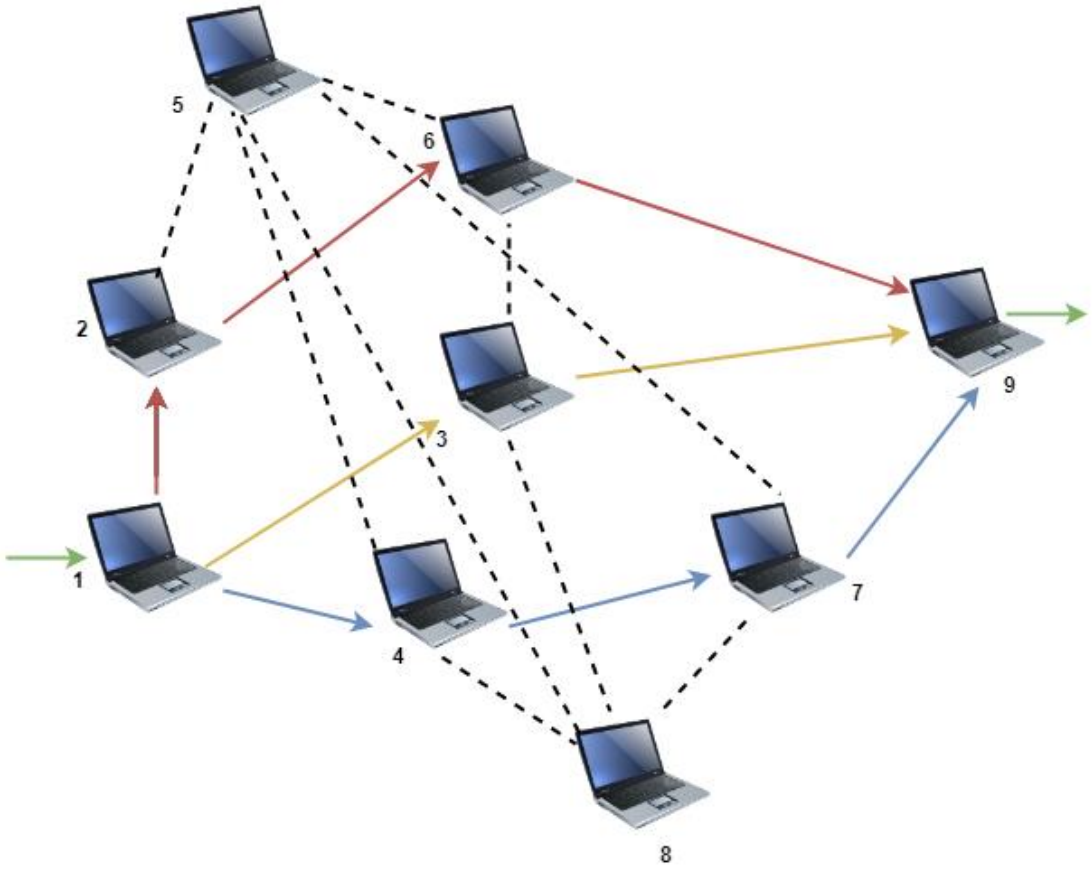

Figure 1. System Architecture of Proposed System

IV.SCOPE OF SYSTEM

The goal is to find the path from source to destination in at most three hops. This increases reliability. It reduces overhead of on demand route discovery and maintenance. Overcomes the problem of number of hotspots.

V.OBJECTIVES

1. To reach the destination in three hops to increase the network scalability and capacity.
2. To reduce overhead and number of hotspots.
3. Avoiding the overloading of the base stations.
4. Analyzing the impact of limiting the hop count.
5. Reduce congestion.

VI. MATHEMATICAL MODEL

The proposed system used below mathematical approach.

Now here S is the system which including the

S = {I, O, R}

I = {N1, N2, N3}

Where,

N1 = {N11, N12} is number of nodes.

N2 = {SN} is source node.

N3 = {DN} is destination node.

O = is set of outputs where 3 hops will be displayed.

R = is a function where the data is routed from source to destination.

The message will be divided into streams and the it will be forwarded in distributed manner.

Where system will be define as,

Let W= {NN, SN, D, BS}

Where,

1. NN= Neighbor nodes.
   Choose Neighbor nodes.

2. **SN=** source node.
   If it is a source node then,

- Routing conducted by a source node.
- Choose relay nodes based on requirement.

3. Send segments through source node.
4. Routing conducted by a neighbour node.
5. Selection of neighbour node and message forwarding.
6. Divide or segmentation over 3 hop path.
7. BS= Base Station
   Congestion control in Base station

8. Check next hop is BS or not?
   Where D = Destination
   - If it is a Base station the it directly act as a destination and;
   - If it is not a Base station then again send data to next 3 hops and it will reaches to destination.

VII. CONLUSION

DTR reduces overhead by reducing route discovery and maintenance. Additional characteristics for example node selection, finding high capacity forwarder, short path lengths, congestion avoidance are proposed by DTR. DTR significantly adds to the network throughput capacity due to the best quality, scalability, and reliability for the Hybrid Wireless Networks. With the numerical evaluations in the MIP models the consequence of minimizing the amount of hop counts can be analyzed. It will help in rise in the network lifetime if the number on minimizing the hop count is no bit relaxed. To realize maximum lifetime, up to 32% increase of minimum hop count is need based on the area and the number of nodes within the network.

REFERENCES

[1] Haiying Shen, Senior Member, IEEE, Ze Li, and Chenxi Qiu, "A Distributed ThreeHop Routing Protocol to Increase the Capacity of Hybrid Wireless Networks," IEEE transactions on Mobile computing, Vol.14, No.10, October 2015.

[2] Huseyin Ugur Yildiz, Murat Temiz, and Bulent Tavli, "Impact of Limiting Hop Count on the Lifetime of Wireless Sensor Networks"IEEE Communications Letters, Vol. 19, No. 4, April 2015.

[3] Tong Meng, Student Member, IEEE, Fan Wu, Member, IEEE, Zheng Yang, Member, IEEE, Guihai Chen, Member, IEEE, and Athanasios V. Vasilakos, Senior Member, IEEE, "Spatial ReusabilityAware Routing in Multi-Hop Wireless Networks"IEEE Transactions on Computers, Vol.65, No.1, Janary 2016.

[4] AtulAdya,ParamvirBahl,JitendraPadhye,AlecWolman, Lidong Zhou, "A Multi- Radio Unication Protocol for IEEE 802.11Wireless Networks,"Microsoft Research, Proc. 1st Int. Conf. Broadband Netw.,2004, pp. 344354.

[5] C. E. Perkins and P. Bhagwat, "Highly dynamic destination sequenced distancevector routing (DSDV) for mobile computers,"Proc. 4th Annu. ACM/IEEE Int. Conf. Mobile Comput. Netw., 1998, pp. 8597.

[6] J. Broch, D. A. Maltz, D. B. Johnson, Y.-C. Hu, and J. G. Jetcheva, "A performance comparison of multi-hop wireless ad hoc network routing protocols,"in Proc. 4th Annu. ACM/IEEE Int. Conf. Mobile Comput. Netw., 1998, pp. 8597.

[7] Ze Li and Haiying Shen ,Department of Electrical and Computer Engineering Clemson University Clemson, SC 29634, USA" A Distributed Three-hop Routing Protocol to Increase the Capacity of Hybrid Networks", 2009 International Conference on Parallel Processing.

[8]Liu, Benyuan, Patrick Thiran, and Don Towsley. "Capacity of a wireless ad hoc network with infrastructure." *Proceedings of the 8th ACM international symposium on Mobile ad hoc networking and computing*. ACM, 2007.

[9] Preetha Thulasiraman, Xuemin (Sherman) Shen Department of Electrical and Computer Engineering, University of Waterloo, 200 University Avenue West, Waterloo, Ontario, Canada N2L 3G1," Interference aware resource allocation for hybrid hierarchical wireless network", Computer Networks 54 (2010) 2271–2280

[10] Cheikh Sarr, Claude Chaudet, Guillaume Chelius, Isabelle Gu´erin Lassous Inria Ares Citi, Insa de Lyon Bˆatiment L´eonard de Vinci21, avenue Jean Capelle – 69621 Villeurbanne Cedex France," A node-based available bandwidth evaluation in IEEE 802.11 ad hoc Networks", International Journal of Parallel, Emergent and Distributed Systems Vol. 00, No. 00, July 2005, 1–21

[11]S. Chachulski, M. Jennings, S. Katti, and D. Katabi, "Trading structure for randomness in wireless opportunistic routing,"in Proc. SIGCOMM Conf. Appl.,Technol., Archit. Protocols Comput. Commun., 2007, pp. 169180.25