IJRSET MAY 2019 Volume 6, Issue 5 Pages: 8-16
ISSN 2394-739X
International Journal for Research in Science Engineering and Technology

OPTIMIZED QUEUE SCHEDULING USING ENERGY HARVESTING AND CONTROLLING IN MANET

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ABSTRACT- Identifying a progressively appropriate and dependable energy productive aware routing for MANET from accessible conventions and to tailor the congestion control instruments to improve the performance of MANET is done in this work. We consider the energy consumption for transmitting and receiving of all nodes in the system for the hand-off determination and information packet transmissions. In this paper proposed to Optimized Queue Scheduling using Energy Harvesting and Controlling in MANET. The performance of the Enhanced Random Range Based Wireless Streaming Algorithm plot is assessed using different measurements, for example, Scalability Ratio, Average Jitter, Cost Per Packet, Energy Congestion, and Node Counter Ratio.

Keywords: [Queue Scheduling, Energy Harvesting, Congestion, Node Counter, Average Jitter, Scalability.]

1. INTRODUCTION

In MANET the numerous jobs of nodes as routers and terminals, and multi-bounce forwarding of packets, and portability induced successive transmission of route packets may create one of a kind queue elements. The decision of scheduling algorithm to determine which queued packet to process next will significantly affect the general start to finish performance when traffic load is high. There are a few scheduling arrangements for various system situations. Diverse routing conventions utilize various techniques for scheduling. The drop-tail strategy is utilized as a queue for the board algorithm in all scheduling algorithms to cradle the board. For the scheduling algorithms that give a high need to control packets, diverse drop strategies are utilized for information and control packets when the cradle is full. Existing techniques, which identifies congestion using an exponentially weighted moving average of the queue length, and drops or stamps packets relative to at a router cradle before the support overflows. It can forestall worldwide synchronization, lessen packet misfortune rates, and minimize inclination against bursty sources. It has been demonstrated that the framework's balance point is steady for relative marking plans. Existing techniques were additionally pointed out that the average queueing postponement and throughput are delicate to traffic burden and control parameters. To defeat these shortcomings, in this stage

proposed the virtual rate control (VRC) algorithm to direct the queue length with little variety and to accomplish high usage with little packet misfortune in various system conditions and dynamic traffic changes. Since the algorithm depends on rate control, i.e., the marking likelihood is principally relative to the queue inhabitance rate, the VRC algorithm can accomplish a fast reaction to traffic variances. The virtual objective rate is embraced to maintain the balance input rate around the link limit and to control the queue length. This paper makes the following commitments: (1) we break down the soundness of the VRC algorithm with TCP elements from a control-theoretic standpoint, (2) using the aftereffect of investigation, we determine the parametric ranges that can make the framework remain steady and present reenactment results to approve the examination.

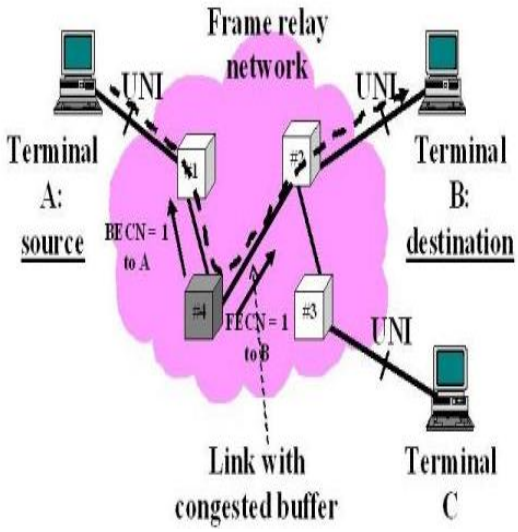

Figure 1: Network Congestion

Secured information transmission is a challenging errand in MANET. A protected MANET condition ought to give privately, integrity, legitimacy, accessibility, and nonrepudiation. The vulnerabilities that make MANETs exceptionally insecure are: dynamic nature of the wireless correspondence, node security, and tampering constrained force in node, congestion control routing and nonappearance of infrastructure. Detecting and controlling the congestion is a significant action to minimize the postponement for enabling the system to perform quicker information transmission towards the secured correspondence between versatile nodes. MANET empowers the change of information among the different separated systems or portable clients. In MANET every cell phone functions as a router and help each other for effectively delivering the information. Progressively organize condition each link limit is finite and the total interest of the assets may surpass when contrasted with the accessible limit. In such circumstances, the link gets over-burden and when this happens it gets blocked. This congestion might be permanent or brief. If there should arise an occurrence of brief congestion, the packet showed up suddenly in a burst. Answer for transitory congestion is conceivable by providing a significant cushion space in the router for allowing packets for out-bound links to spend a brief period before being sent to the next link. Congestion is a circumstance in MANET, in which such a large number of packets are accessible between sources to destination nodes in a piece of the subnet. Congestion is an issue that happens on shared systems when various clients need to get to similar assets (transfer speed, cradles, and queues) and requests of this asset become more noteworthy than the limit of the system. The intermediate nodes are answerable for forwarding the information packets, if not ready to convey all the packets with a similar appearance rate make a queue for storing the packets for a brief period of time. Along these lines, packets can sit tight for their transmission between nodes. The congestion can happen depending on the different factors, for example,

(i) When the number of packets sent to the system is more noteworthy than the number of packets a system can deal with

(ii) To perform bookkeeping assignments, for example, queuing cradles, updating tables

(iii) When the input traffic rate is equivalent to or surpasses the limit of the yield lines

(iv) When the increase in the assets, for example, data transmission increases, traffic splitting over numerous routes. Congestion prompts packet misfortunes, long postponement, transmission capacity corruption, route disappointment, node-link misfortunes and high overhead in a system. Along these lines, congestion control methods are required to beat the issue of congestion in MANET

2. LITERATURE SURVEY

[1] Istikmal, Adit Kurniawan and Hendrawan (2015) proposed an examination and technique for choosing the most fitting routing protocol to cooperate with congestion control of TCP NewReno. To examine the performance of level routing protocol AODV, DSDV, and DSR which are commonly utilized in the Adhoc network Routing protocols tried first on the grounds that the routing calculation turns into a basic accomplishment preceding the information transmission connection before the congestion control system. The preliminary outcomes demonstrated that the most proper routing protocol with congestion control can improve arrange execution, which is DSR and TCP NewReno. Cooperation among DSR and ADTCP has preferable performance over DSR with TCP NewReno, on the grounds that ADTCP can recognize network condition all the more accurately. Routing protocols and congestion control cooperation still face vulnerability to guarantee the quality of connection, which cause visit way break because of versatility.

Merits:

- Congestion control is a system to control and identify congestion in TCP. This component controls the window or packet transmission.
- Behavior and capacity to recognize congestion and its motivation will affect on network performance.

Demerits:

- Requires capacity of the hub to decide the TCP-F sender.
- Reactivated congestion window may not reflect permitted network reactivated congestion window may not reflect permitted network rate.

[2] A. Pratapa Reddy and Dr. N. Satyanarayana (2016) proposed an energy-efficient stable multi-way routing in MANETs with Congestion Aware. This methodology is an extension work where bandwidth and postponement are considered during the routing. Here in this methodology network evaluates the leftover energy and security of the links in the network. While assessing the remaining energy it likewise considers the accepting energy and transmitting the energy of the hub. At that point steadiness of the link, LET is assessed, this LET is acquired by utilizing motion parameters for example speed, the direction of the hubs.

Merits:

- The advantage of this methodology is that the best way can be picked during the routing dependent on every one of these factors.
- Also, the battery level of the hubs can be taken into consideration in the network. This outcome is the network's great throughput and high efficiency.

Demerits:

- Bandwidth and deferral are considered during the routing
- In the MANETs, the lingering energy and security are one of the fundamental issues at present.

[3] Senthilnathan Palaniappan and Kalaiarasan Chellan (2015) propose a

stable and energy-efficient routing method. In the proposed system, nature of administration (QoS) monitoring pros accumulate and register the connection steadfast quality estimations, for instance, link received signal strength (LRSS), link expiration time (LET), link packet error rate (LPER) and probabilistic link reliable time (PLRT). The routing soundness of a MANET is improved by this cross-layer model. Stability and energy efficiency to the current routing protocol utilizing fluffy rationale decision model. These sorts of measurements help to locate the most reliable link and lessen the number of route reconstructions in remote networks. Power information or a signal-to-interference-plus-noise ratio (SINR) to the routing layer, and the routing layer chooses the neighbor hubs' level utilizing it and figures the backoff time and information rate for the link layer utilizing the hub's level.

Merits:

- The routing soundness of a MANET is improved by this cross-layer model.
- Stability and energy efficiency to the current routing protocol utilizing fluffy rationale decision model.

Demerits:

- As route, strength and energy efficiency are the two significant issues of routing in MANET.

[4] Hannan Bin Liaqat, Amjad Ali, Junaid Qadir, Ali Kashif Bashir, Muhammad Bilal and Fiaz Majeed (2019) proposed a Socially-mindful congestion control in ad-hoc networks: Current status and the route forward. Consolidating social mindfulness into congestion control plans. To return to the current traditional ad-hoc congestion control and information distribution protocols and propel the requirement for implanting social awareness into these protocols to improve performance. The activities of an artful network are somewhat not the same as ASNETs. Cunning networks work only in a connectionless environment; regardless, ASNETs can work in the two environments. The implementations of these protocols are anything but difficult to convey at the vehicle layer. Because of rare bandwidth and remote link misfortunes, the above techniques can't give greatest information rates in Adhoc environment.

Merits:

- Good disappointment recuperation.
- The capacity to add networks without hindering existing services.
- High error-rate dealing.

Demerits:

- TCP sequence numbers and incredibly, high bandwidth pipelines don't fit well with long deferrals

[5] Abedalmotaleb Zadin, Thomas Fevens (2016) presents extensions of late contemplated position-based stable routing protocol Greedy based Backup Routing Protocol with Conservative Neighborhood Range to keep up connection security while limiting the quantity of undermined packets within the sight of increasingly broad communication impedance. Simulation results demonstrate the practicality of the new protocols. To exhibit impedance mindful versions of GBR-CNR, the primary such obstruction mindful and stable position-based routing algorithms. The only other distributed interference aware position-based routing calculation that doles out various transmission reaches to every hub while limiting the most extreme interference and keeping up a connected communication. To see that as far as limiting the communication interference in MANETs, the effect of GBR-CNR-LU consistently outperformed the various versions of the GBR, to be specific, the GBR-CNR, LBR, and GBR-CNR-LN algorithms.

Merits:

- This is to some degree on the grounds that both GBR and LBR have additional arrangements of reinforcement ways which, when associated with packet communication, increment the quantity of hubs taking an interest in the general communication in MANETs
- Routing protocols as being broadly classified into two methodologies, topology-based routing, and position-based routing.

3. PROPOSED WORK

3.1 OPTIMIZED QUEUE SCHEDULING

The circulated scheduling algorithm with low intricacy is utilized for scheduling the packets. Each vacancy having an initial scheduling property which is additionally isolated into n mini-slots. Each link must be booked and chose according to the scheduling slot. Each availability comprises of an initial scheduling slots is additionally partitioned into specific mini-slots. In the scheduling slot, the links are rest of availability chose to be booked and transmit their packets in the system.

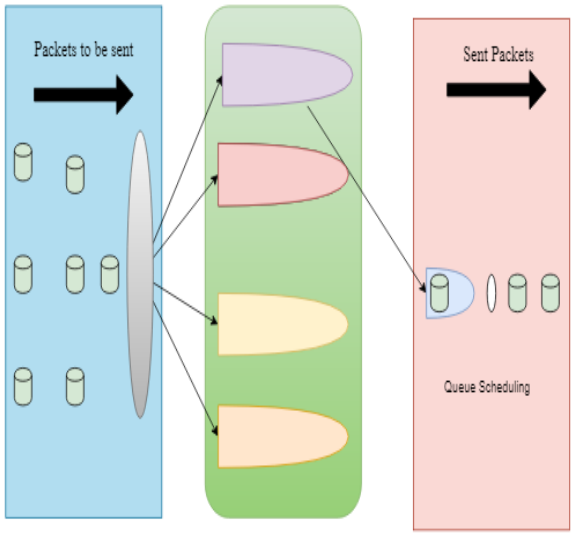

Figure 2: General process of scheduling

In this stage, an optimized queue scheduling is planned and executed. It plans the information packets dependent on its virtual rate. The virtual rate is joined to the header of the information packets. Its worth depends on the queue length of the node, information rate of the source (which is standardized concerning channel limit), and the expiry time of the packet. This scheduler favors information packets when contrasted with control packets. It intends to improve the average throughput by rapidly delivering packets with more prominent remaining jumps or distance.

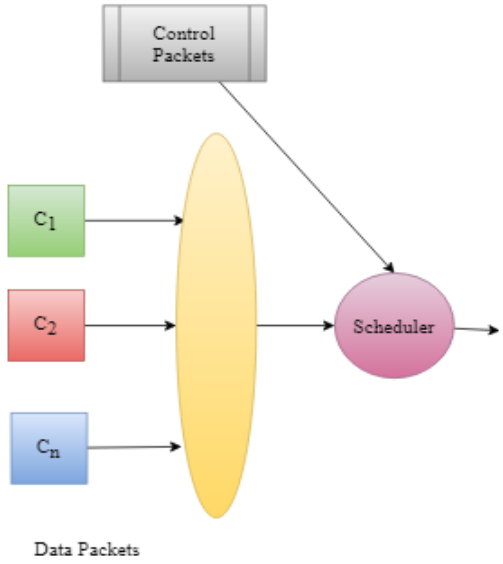

Figure 3: Packet Scheduling

When looking into the impact of setting needs to information packets and considering the appropriateness of the various sorts of scheduling algorithms for MANET, a few scheduling plans were contemplated in writing. In request to think about the impact of setting needs to information packets, these schedulers give a high need to control packets. Their disparities are in assigning needs among information queues. Figure 1 shows the need for scheduler for information packets. Weighted-jump and weighted-distance scheduling strategies utilize distance measurements. Weighted-bounce scheduling gives higher load to information packets that have less remaining jumps to cross. On the off chance that the packet has fewer remaining jumps, at that point it needs to arrive at the destination rapidly. The

information packets can be put away in round-robin design. The remaining bounces to cross can be obtained from packet headers. Weighted-distance scheduling gives a higher load to information packets that have shorter geographic distances. The remaining distance is the distance between a picked next bounce and a destination. Cooperative scheduling maintains per-flow queues. The flow can be distinguished by a source and destination pair. Here each flow queue is allowed to send each packet in turn in a cooperative style. In the insatiable scheduling plan, every node sends its own information packets before forwarding those of different nodes. The information packets of different nodes are overhauled in FIFO request.

4. EXPERIMENTAL RESULTS

SCALABILITY RATIO

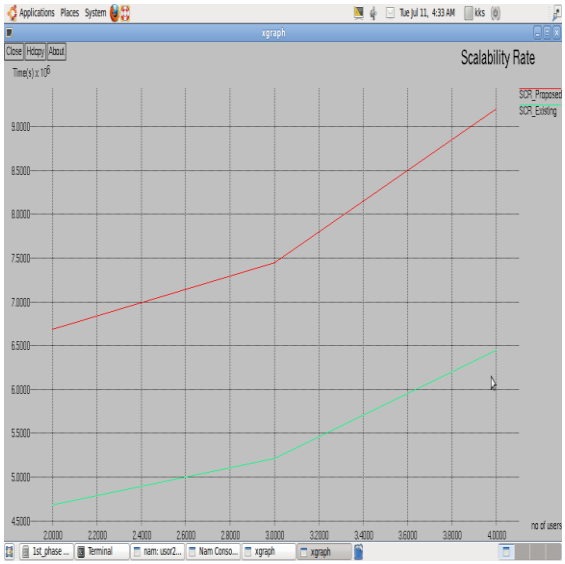

Figure 4: Here checking the scalability of our process and compared with existing model, but our proposed model having high scalable ratio better than existing model.

Figure 4 demonstrates the examination of the Scalability Ratio. Scalability Ratio is defined as the quality of a framework, model or capacity that depicts its ability to scope and perform well under an increased or expanding outstanding task at hand or extension. Their existing Scalability ratio esteems are commonly defined as between 4.5500 to 6.5000. Proposed Scalability ratio esteems are defined as between 6.5500 to 9.5600. These outcomes are recreated using the NS2 simulator. This outcome shows a reliable outcome for the proposed novel procedure. Consequently, the proposed strategy delivered a superior improvement in scalability ratio results. Henceforth the proposed technique delivered a noteworthy improvement in results.

AVERAGE JITTER RATIO

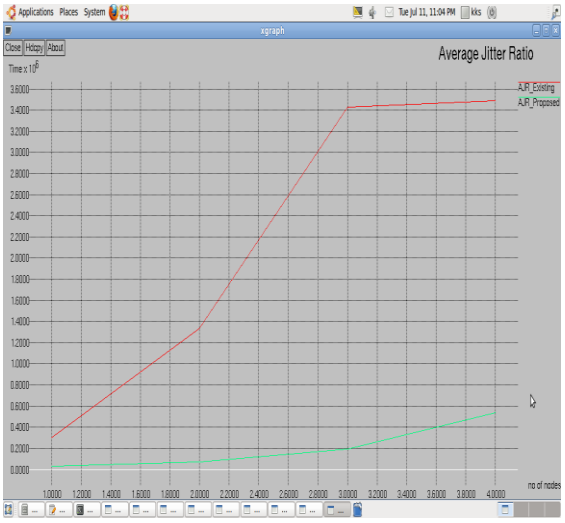

Figure 5: Jitter ratio, it's a latency of time in our work. In proposed having only less amount of Jitter Latency compared to previous model.

Figure 5 demonstrates the examination of the Average Jitter Ratio. Average Jitter Ratio is defined as IP arrange is the variety in the idleness on a packet flow between two frameworks, when a few packets take more time to head out from one framework to the next. Their jitter results are from organizing congestion, timing float and route changes. Their existing Scalability ratio esteems are commonly defined as between 0.2600 to 3.5000. Proposed Scalability ratio esteems are defined as between 0.0300 to 0.6000. These outcomes are mimicked using the NS2 simulator. This outcome shows a reliable outcome for the proposed novel

procedure. Henceforth the proposed technique created a superior improvement average jitter ratio results. Consequently, the proposed technique created a noteworthy improvement in results.

COST PER PACKET

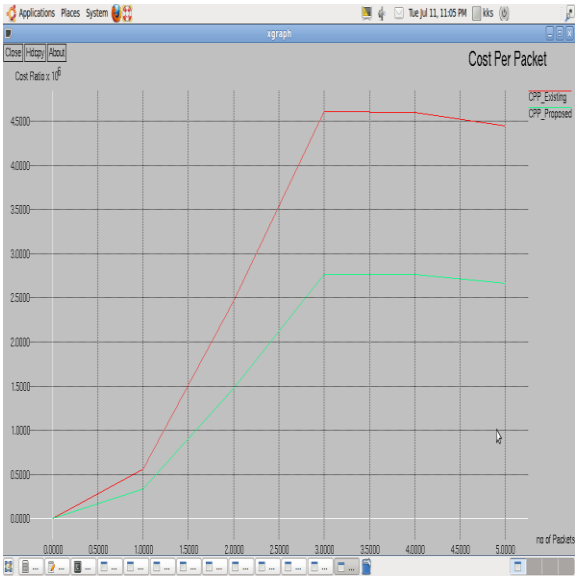

Figure 6: Above graph mentions the cost of per packet transmission in our proposed model and comparing to existing model. In proposed model having only low amount of cost compared to previous model.

Figure 6 demonstrates the examination of Cost Per Packet Ratio. Cost Per Packet Ratio is defined as the ratio of packets effectively got to the complete sent and their throughput rate is sent through the system. Their existing Cost per packet ratio esteems are commonly defined as between 0.0000 to 4.4430. Proposed Cost per packet ratio esteems are defined as between 0.0000 to 2.6800. These outcomes are mimicked using NS2 simulator. This outcome shows a predictable outcome for proposed novel procedure. Thus the proposed technique created a superior improvement cost per packet ratio results. Henceforth the proposed strategy delivered a noteworthy improvement in results.

ENERGY CONSUMPTION PER PACKET

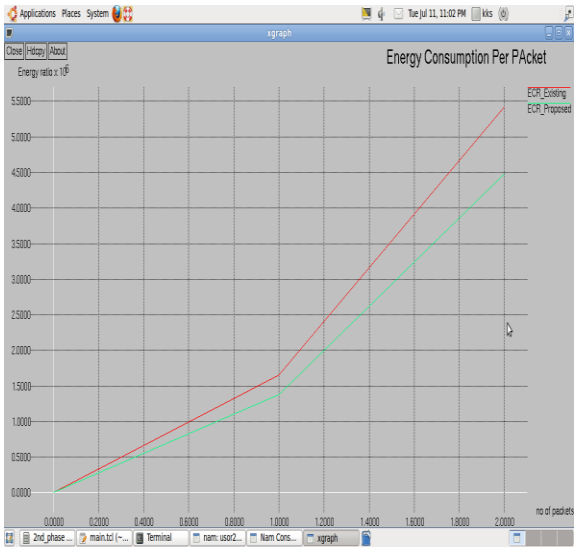

Figure 7: Here calculates the energy consumption rate for per packet and compares the result between existing and proposed model, in our proposed process taken low consumption rate comparing to previous model.

Figure 7 demonstrates the examination of Energy Consumption Per Packet Ratio. Energy Consumption Per Packet Ratio is defined as the measure of energy or force utilized in packets, node transmission. Their existing Energy Consumption Per Packet Ratio esteems are commonly defined as between 0.0000 to 5.4930. Proposed Energy Consumption Per Packet Ratio esteems are defined as between 0.0000 to 4.5000. These outcomes are recreated using NS2 simulator. This outcome shows a predictable outcome for proposed novel procedure. Thus the proposed strategy created a superior improvement Energy Consumption Per Packet Ratio results. Consequently the proposed strategy created a critical improvement in results.

MAXIMUM NODE COST

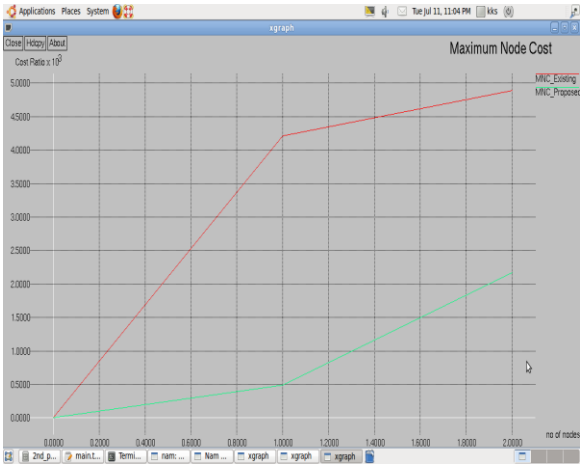

Figure 8: Node cost calculation shows in above graph, here proposed method having less cost while comparing to previous process node cost ratio.

Figure 8 demonstrates the correlation between the Maximum Node Cost Ratio. Greatest Node Cost Ratio is defined as the measure of the performance of a system, as each system is distinctive in nature and plan. It can likewise be displayed and recreated instead of estimated and model queuing performance or to utilize a system simulator. Their existing Maximum Node Cost Ratio esteems are commonly defined as between 0.0000 to 4.4930. Proposed Maximum Node Cost Ratio esteems are defined as between 0.0000 to 2.1900. These outcomes are recreated using the NS2 simulator. This outcome shows a steady outcome for the proposed novel procedure. Subsequently, the proposed strategy delivered a superior improvement Maximum Node Cost Ratio results. Subsequently, the proposed technique delivered a huge improvement in results.

CONCLUSION

Hybrid Congestion Control Mechanism includes systems that are Optimized Queue Scheduling, Hop-by-jump congestion control, and Congestion Aware Adaptive Routing. We investigates and quantifies the ideal performance of a congestion convention during link and cushion congestion states; at that point builds up connections between ideal transmission window and reserve size at congestion states in MANET, and gives a premise to future congestion control the executives that ensures congestion shirking while at the same time meeting the ideal identification and routing performance.

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