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Automatic on-Demand Selection of Suitable Wireless Scheduling Algorithm to Minimize Queue Overflow Probability

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***Abstract*—** In this paper, it is been studied the robustness of light traffic obtained by the tuning algorithm for various traffic networks. Since processing the programming algorithm is unaffected using the standard mathematical tool, the aim is to reduce the maximum likelihood of saturation obtained by the algorithm. In large deviation settings, this problem is equivalent to increasing the amount of asymptotic decomposition of the maximum possible. It is start by getting more of the decaying level of the fullness of the line as the line's fullness decays closer to infinity. Subsequently, made study several structural properties of the low-cost method of linear saturation in a large length, which is an approximation to the decay rate of the largest saturation point. Given these properties, proven that the line with the largest length follows the sample path that extends through the line. At a certain parameter value, the sorting algorithm is very good at reducing the length of the largest line. For numerical results, it is have shown the large-scale deviation properties of the line lengths that are commonly used while varying one algorithm parameter.

Keywords— Line saturation, wireless algorithms, Round Robin programming, Scheduling greed.

I. INTRODUCTION

The motive of this paper work is to create an automatic on demand selection of suitable wireless scheduling algorithm to minimize the queue overflow probability. Since wireless channels time varies, with the right selection algorithm, it is possible to achieve multi-user diversity, which improves system performance significantly. Most case studies of algorithms are focused on generating an average user rating, i.e., robustness. From the standpoint of stability, it is important to design an algorithm that arranges the distribution in such a way that the lines are tightened to a given load. Absolute entry algorithms are considered to be stable [1]. The definition of the appropriate algorithm is as follows: for any given load if any other algorithm can tighten the system, the designated algorithm can remove the system again. For example, MaxWeight (MW) and Exponential (EXP) algorithms are more than optimal production because they guarantee line stability with robustness if that is possible [2]. Alternatively, robustness means that the average packet delay for users cannot come to fruition. Although robustness is an important metric for designing a high-precision access algorithm, for many sensitive sensors and with validation rates For real-time applications such as voice and video, often need to ensure the extra condition that the packet delay should be tied up or the long jump should be minimized by some color placement as high as possible. . One way of building the requirements of these systems to include significant and guaranteed delays is to enforce constraints on the assumption of line saturation. LINK optimization is an important function of wireless networks due to the nature of both wireless networks and the variability of the wireless channel over time. In the past, it has been shown that by choosing carefully the planning decision based on the channel type and / or the need for users to operate the system can be greatly improved [3]. Most case studies of algorithms are focused on building an average user base or, in other words, robustness. The proposed scheme wraps in two. Part one involves measuring the flow rate very high. The other part involves calculating the probable decrease in the gain. To provide simulation results to validate analytical results in the initial stages. Simulate the following program with four links with three provinces. Optimizing algorithms are focused on building an average user base or, in other words, robustness. There are a large number of users waiting in line but due to interruptions, Base Station can process one user at a time. This is known as single Server Serving Queue. Base Station receives data at regular rate & at each time-slot the wireless station can be in one of the regions. At each slot Base station it serves the user with a measure of its corresponding service [4]. The goal is to get routing scheduling algorithms in such a way that the lines are tightly aligned to a given load, maintain full utilization, strengthen the transmission rate and reduce the load and find out which algorithm algorithms strengthen the entire system.

II.RELATED WORK

Scheduling algorithms determines which packet is released next to packages in the queue (queue). The schedule is located between the router agent and above the MAC ladder. All nodes use the same sorting algorithm. It is take into account the general planning (proper planning first) commonly used in ad hoc ad networks [5] and propose alternative structured learning policies. All the learning algorithms studied are not optional. As with the buffer management algorithm, the drag tail policy is used with prioritized planning. The tail-dropping policy is dropping incoming packets when the buffer is full. For programming algorithms that give priority to managing packets, it apply different deployment policies for data packets and control packets when the buffer is full. When an incoming packet is a data packet, the data packet is disconnected. When an incoming packet is a control packet, it will throw the last-line data packet, if any buffer exists, to make room for the control package. If all packets in a row are in control packets, it will throw an inbound control packet.

a. Non-priority Scheduling

Programming services that do not prioritize both control and data packets in FIFO orders. By incorporating this classification algorithm to compare the effect of giving priority to marking packets [6].

b. Priority Scheduling

Priority setting gives priority to top packs. It stores control packets and data packets in a separate row in the FIFO order. Currently, this program is widely used in comparative studies on mobile Ad-Hoc networks. After examining the effects of giving priority to traffic control, it is consider the results of the most important data set [7]. It create different algorithms for classification using distance metrics, take into account equations, and use multiple geographical roles such as routers and data sources. All the editing algorithms it describe below give priority to administration rather than data packets. Their difference in weight distribution or more importantly between the data line.

c. Round Robin

The rotating robots configuration keeps track of each flow. It is identify each source flow and destination (IP address, port number). In the order of spherical robots, each flowing line is allowed to send one packet at a time to the robin fashion [8]. It examine the arrangement of spherical robots to see the effect of operation by having an equal opportunity for the medium in the flow.

d. Greedy scheduling

In a virtual greedy program, each node sends its own data packets (packets it generates) before sending those other nodes. Other geographical data packets are provided by FIFO order. It is test whether such greed negatively affects network performance. Although it is common in wired networks for a node to act as both a source and a router at the same time, it is common in ad hoc networks [9].

e. Problem Structure

In this paper, the interest is shown in the planning of wireless algorithms for single-cell transcription that can reduce the probability of an over-line. Specifically, in the large-scale deviation, interested in algorithms that increase the asymptotic degeneracy of the queue-over-flow model, as the line-over-fl state line reaches the bulk path [10]. First, find the upper bound of the decay rate overriding the policy of all planning policies [11]. Then focus on the clustering algorithms collectively called “algorithms.” In the interim, the algorithm picks up the service user at the same time with a larger output of the transmission rate multiplied by the power-backed backlog. It is shown that when the metric above fl O is properly converted, the low-cost-to-over flow under the algorithm can be achieved by a simple linear approach, and can be written as a solution to the vector optimization problem. Using this property of the construct, it is shown that when approaching unity, the algorithms asymptotically reach the largest number of possible linear declines. In the end, this result allows us to design sequences of closely related algorithms with an asymptotic decomposition rate of greater than one and are displayed dynamically to keep the − line probabilities smaller than the effective profit margin [12].

III. METHODOLOGY

After examining the effects of giving priority to traffic control, look at the results of the most important data set setup. Then create different algorithms for classification using distance metrics, take into account equations, and use multiple geographical roles such as routers and data sources. All the editing algorithms it describe below give priority to administration rather than data packets. Their difference in weight distribution or more importantly between the data line [13]. The classification algorithms use distance metrics to set priorities for the data. It is well understood that in one area if the magnitude of the task is known, scheduling a shorter working time (SRPT) is a policy that shortens the response time. Then apply this concept to a multi-site ad network. It is expected that such an edit could be improved by intermittently sending packets with the remaining hops or a larger range [14]. However, when it is assign too much value to data packets with long distance metrics, intermediate entries and delays are damaged. Compared to packets with few remaining hops or short distance remaining, packets with remaining hops or larger remaining distance may suffer route changes, resulting in multiple returns to the MAC layer. Therefore, data packets have longer meta-data that require longer service times. Queuing process is defined by an application program built using the Java platform. The various modules involved in this process are as follows:

- *Client form*
- *Request Send*
- *Queuing in Router*
- *Server Response*

A. Module Definition

Client form: Clientform is the front end the Mobile user will be built with the following features

- The entry form.
- SMS Banking.
- Account Summary.
- Bill Payment

Request Send: The client request will be sent to the Router via Transfer Rate. For example if a client application for an Account Summary that request will be processed using a router with a routing value for a specific request on the router.

Queuing in Router: The route design will contain the client name, the requested service, the status of the request, the routing rate and the server name. In the router's request it will be stored online until the maximum value is reached, after access to the request to be processed based on the routing level.

Server Response: On this Server will receive client request information from the router depending on how each request will be forwarded to the router and the response will be sent to the client? After receiving a response from the server the status of its request will be changed. Figure 1 shows the data flow.

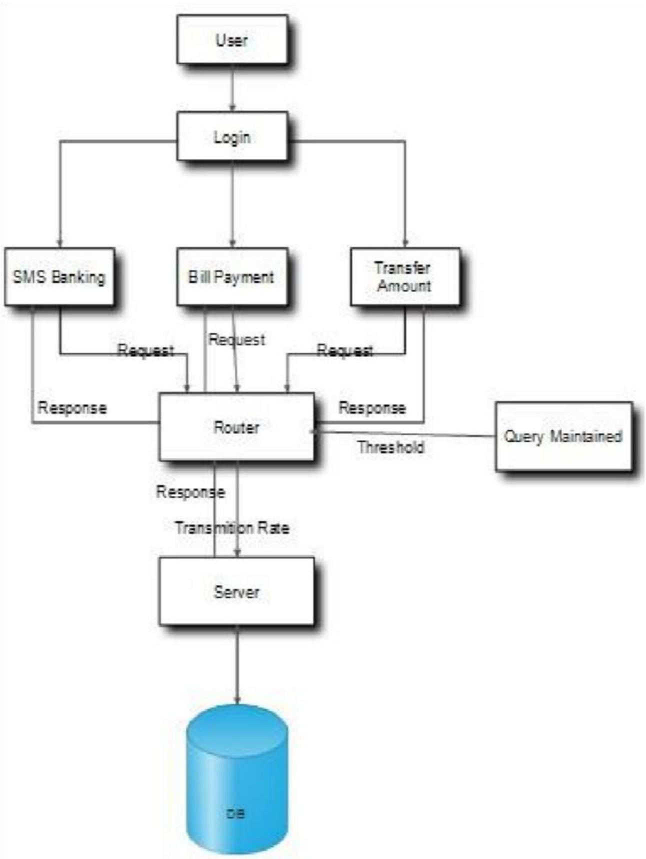

Figure 1. Diagrammatic Representation of the Application system

IV. PERFORMANCE EVALUATION

The default size of the default target for each node is 64 packets. The directory manager is shared across multiple rows where the scheduler stores multiple rows. The implementation of the DSR agreement using java also secured the sale of the 64 packets used during the route discovery. Maximum wait time on a return during route detection is 30 seconds. If the packet stays in the short-term shop for 30 seconds, the packet is thrown. In GPSR protocol implementation, set the beacon time to one second. Beacons are sent strictly to the GPSR protocol. It is assumed that each node knows the current location of the destination because the first GPSR measurement code does not include a destination database. Each source supplies its packets with the current destination location. Therefore, the GPSR simulation results may be better than the GPSR simulation results with the location service. Make use of 50 mobile nodes in a grid of size 1500m x 300m. Then ran the simulation every 900 seconds. Then use the random method model because it is the most widely used travel model in previous studies [3]. In this model, the node decides to move to a random location within the grid. When it arrives at that location, it pauses for a limited period of time, maybe zero seconds, and then moves on to another random spot. The maximum allowed speed of a node is 20 meters per second. Make use of the standardized source (CBR) source as the data source for each location. Each source node transmits packets at a specific rate, with a packet size of 512 bytes. Select source and destination domains at random between all locations. Peer interaction patterns, and interactions were started at random intervals between 0 and 180 seconds. Then vary the load and traffic rate. Change the load of traffic by changing the amount of resources or the amount of packet shipping.

Then control the movement rate at rest. Make use of stop times of 0, 30, 60, 120, 300, 600 seconds, and 900 seconds. A stop time of 0 seconds means constant movement, and 900 seconds means no movement at all because the measurements run at 900 seconds. The motion condition organizes movement and positioning according to a random path model. Because the simulation results depend on the motion conditions, computed the simulation results over four different motion conditions for each data point. Table 1 shows the simulation parameters.

Table 1. Simulation Parameters

Platform	Java
Buffer Size	64 packets
Maximum waiting time	30 seconds
Connection	GPRS
Number of nodes	50 nodes
Dimension	1500m x 300m.
Simulation time	900 seconds
Traffic	CBR - Constant Bit Rate
Packet size	512 bytes

A. *Performance metrics*

Performance metrics used are delay, throughput, packet loss, computational time and queue overflow probability to evaluate the effect of each scheduling algorithm.

a. Delay

This is the average overall delay for a packet to travel from a source node to a destination node. Table 2 describes the delay analysis between the scheduling algorithms. Figure 2 shows the graph for delay analysis from that greedy algorithm consumes less delay. In the proposed method the delay is reduced about 92%.

Table 2. Delay analysis

No. of Nodes	Delay (seconds)			
	Non-Priority	*Priority*	*Round Robin*	*Greedy*
10	3.857	3.118	2.859	1.472
20	4.294	3.524	2.933	1.924
30	4.583	4.865	3.245	2.518
40	5.39	4.934	3.751	2.956
50	5.821	5.284	4.284	3.587

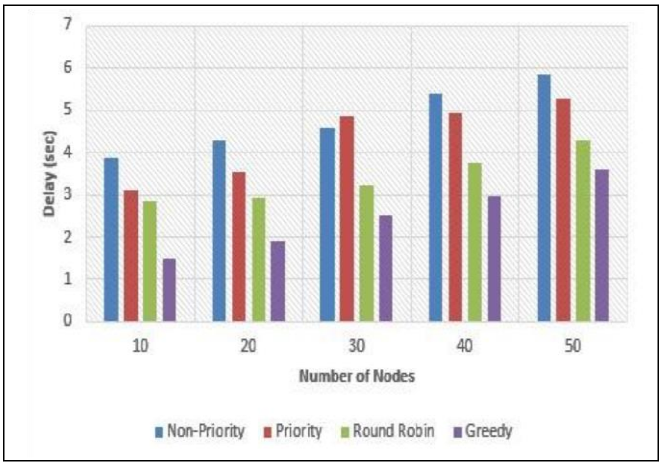

Figure 2. Graph for Delay analysis between scheduling algorithms

b. Throughput

This is the average number of data packets received by the destination node per second. Table 3 describes the throughput gain between scheduling algorithms and figure 3 shows the graph for throughput gain. From this it is understood that greedy algorithm obtains high throughput gain. It is clear that the proposed method produces better throughput on comparing the existing methods of about 95%.

Table 3. Throughput gain

No. of Nodes	Throughput (%)			
	Non-Priority	*Priority*	*Round Robin*	*Greedy*
10	78.65	80.38	89.34	98.75
20	77.53	79.37	88.37	96.48
30	75.28	78.72	86.24	95.24
40	74.72	77.93	84.23	95.11
50	73.03	77.12	81.86	93.28

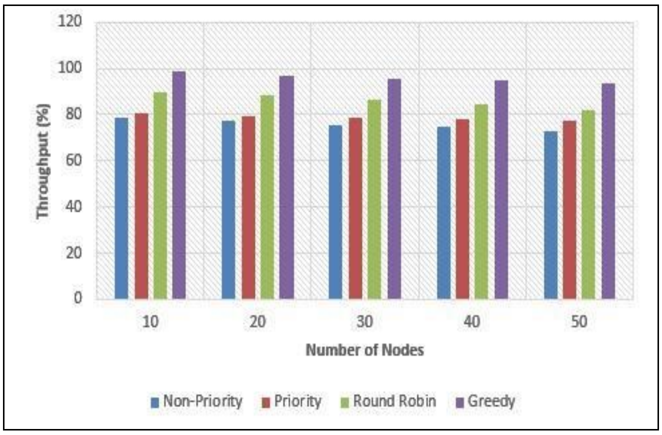

Figure 3. Graph for Throughput gain between scheduling algorithms

c. Packet Loss Ratio

Packet loss is defined as the number of packets lost during the transmission due to network failures or attacks. Table 4 describes the packet loss ratio of scheduling algorithms. Figure 4 shows the graph of packet loss ratio. It shows that greedy algorithm consumes less packet loss than other algorithms. The packet loss ratio is very much reduced in the proposed method about 90%.

Table 4. Packet loss ratio

No. of Nodes	Packet loss (packets)			
	Non-Priority	*Priority*	*Round Robin*	*Greedy*
10	20	16	12	7
20	25	24	18	11
30	27	27	20	14
40	31	30	23	15
50	35	33	25	16

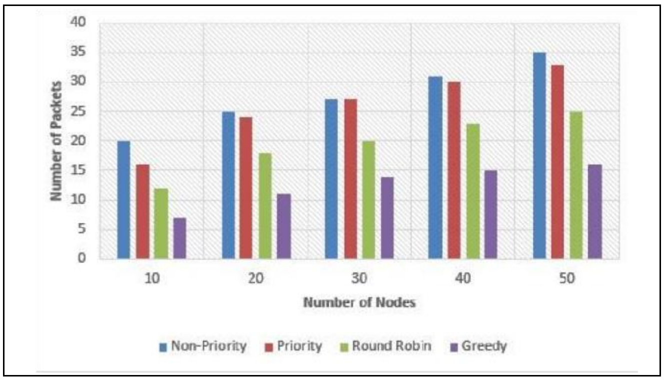

Figure 4. Graph for packet loss between scheduling algorithms

d. Computational Time

Computational time is defined as the total time taken for completing a transmission. It is measured in seconds. Table 5 describes the computation time between the scheduling algorithms. Figure 5 shows the graph for computational time between scheduling time. It shows that greedy algorithm is executed in less computation time. The proposed method uses very little computational time to produce the output. The improvement goes for 97%.

Table 5. Computational time

No. of Nodes	Computational Time (seconds)			
	Non-Priority	Priority	Round Robin	Greedy
10	2.353	1.904	1.438	0.345
20	2.866	2.736	1.728	0.756
30	3.026	2.953	1.992	0.921
40	3.763	3.026	2.018	1.479
50	4.064	3.134	2.144	1.825

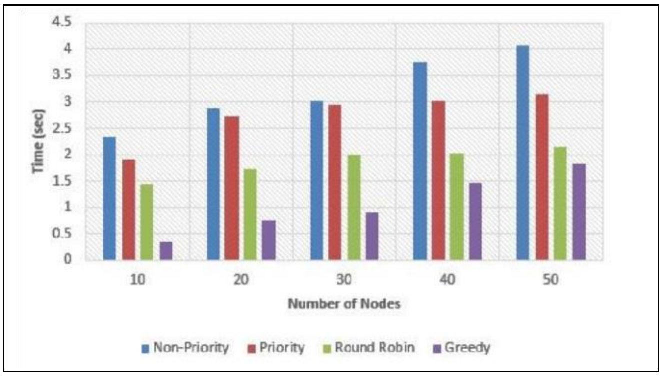

Figure 5. Graph for computational time between scheduling algorithms

e. Queue Overflow Probability

Queue overflow probability is defined as the ratio of the bandwidth which exceeds the execution capacity of the network. Table 6 explains the queue overflow probability between scheduling algorithms. Figure 6 shows the graph view of queue overflow probability. Greedy method consumes less queue overflow probability. The main aim is to reduce the queue overflow. The proposed method handles the queue overflow very efficiently about 96%

Table 6. Queue Overflow Probability

No. of Nodes	**Queue overflow probability (%)**			
	Non-Priority	*Priority*	*Round Robin*	*Greedy*
10	72	63	49	36
20	73	68	51	37
30	75	69	54	42
40	77	71	57	45
50	80	72	60	47

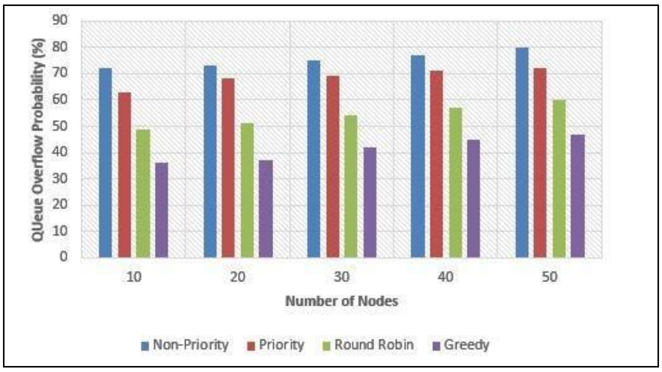

Figure 6. Graph for Queue overflow probability between scheduling algorithms

V. CONCLUSION AND FUTURE SCOPE

It is found that investing heavily in traffic management should be carefully monitored for use according to the principle of use. It is shown that the terms of use with the desired output may have benefited from this arrangement, but the protocol may be. By scheduling algorithms using short distance metrics, data packets can be moved quickly to the relay network, without additional control of the packet exchange algorithms. In addition, the implementation of these algorithms is easy. Therefore, they are readily available to improve performance on service limited ad hoc networks. Finally by applying the insights from this result, draw the hybrid algorithms that are closest to the average asymptotic decay rate of potential overflow and show the power to maintain the minimum probability of saturation over the active line width. For future work it is plan to extend the results to standard network models and channels. In future development each application has its own set of requirements and requirements. The project covered almost all the requirements. Additional requirements and improvements can be made easier as coding is more structured or modular in nature. Replacing existing modules or adding new modules may entail upgrading. It is well understood that the proposed method performs very well in the metrics such as computational time, packet loss ratio, queue overflow and throughput. The improvement is about 98%.

REFERENCES

[1] Venkataramanan VJ, Lin X, "Structural properties of LDP for queue-length based wireless scheduling algorithms". InProceedings of Allerton **2007 Sep 25**.

[2] X. Lin, N. B. Shroff, and R. Srikant, "A tutorial on cross-layer optimization in wireless networks," IEEE J. Sel. Areas Communication., vol. 24, no. **8,** pp. **1452**–**1463**, Aug. **2006**.

[3] L. Tassiulas and A. Ephremides, "Stability properties of constrained queuing systems and scheduling policies for maximum throughput in multihop radio networks," IEEE Transactions Automatic Control, vol. **37**, no. **12**, pp. **1936**–**1948**, Dec. **1992**.

[4] M. J. Neely, E. Modiano, and C. E. Rohrs, "Dynamic power allocation and routing for time-varying wireless networks," in Proc. IEEE INFOCOM, San Francisco, CA, vol. **1**, pp. 745–**755**. Apr. **2003**,

[5] A. Eryilmaz, R. Srikant, and J. Perkins, "Stable scheduling policies for fading wireless channels," IEEE/ACM Trans. Netw., vol. **13**, no. **2**, pp. **411**–**424**, Apr. **2005**.

[6] T. Ramesh and S.Sumithra, OPKNOT – Schemata Method for Mutation Testing Experimented on Event Driven Web Applications", International Journal of Innovative Research in Computer and Communication Engineering, ISSN 2320-9798,Vol **5**, Issue **1**, , PP **761-770**, January **2017**

[7] A. L. Stolyar, "MaxWeight scheduling in a generalized switch: State space collapse and workload minimization in heavy traffic," Ann. Appl. Probab., vol. **14**, no. **1**, pp. **1–53**, **2004**.

[8] T. Ramesh and S.Sumithra, "A Review on Different Approaches of Mutation Cost Reduction Techniques", International Journal of Innovative Research in Computer and Communication Engineering, Vol.**5**, Issue.**1**, pp.**771-775**, January **2017**.

[9] D. Shah and D. Wischik, "Optimal scheduling algorithms for inputqueued switches," in Proceedings IEEE INFOCOM, Barcelona, Spain, Apr. **2006**.

[10] S. P. Meyn, "Stability and asymptotic optimality of generalized MaxWeight policies," SIAM J. Control Optimization., vol. **47**, no. **6**, pp. **3259**–**3294**, Jan. **2009**.

[11] M. J. Neely, "Order optimal delay for opportunistic scheduling in multi-user wireless uplinks and downlinks," IEEE/ACM Transactions Networks., vol. **16**, no. 5, pp. **1188**–**1199**, Oct. **2008**.

[12] M. J. Neely, "Delay analysis for maximal scheduling in wireless networks with bursty traffic," in Proceedings IEEE INFOCOM, Phoenix, AZ, April pp. **6**–**10**. **2008**.

[13] R. Kumari1 , P. Nand, "Performance Analysis of Existing Routing Protocols", International Journal of Scientific Research in Computer Science and Engineering, Vol.**5**, Issue.**5**, pp.**47**-**50**, October **2017**.

[14] S.D.N. Hayath Ali , M. Giri, "A Study on Current Challenging Issues and Optimal Methods for Video Streaming over Heterogenous Wireless Network", International Journal of Scientific Research in Network Security and Communication, Vol.**6,** Issue.**2**, April **2018**.

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