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Efficient Packet Scheduling Technique for Data Merging in Next Generation Networks using Greedy based ANT Algorithm

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Abstract
Mobile users are expanding rapidly and wireless communication is becoming a necessity, which is why the rise of wireless communication devices with less congestion and more Flexibility for 5G is being used full time. Currently India has 4th Generation LTE networks as the latest technology when it comes to data services. 5th Generation LTE networks as the latest technology when it comes to data services. 5th Generation network are yet to come to market. 5th Generation means the next largest category of telecommunications standards over the next 4G levels. 5G technology will change the way users in high-speed bandwidth as 5G is deployed over a VOIP-never before seen, it provides functionality in product Engineering, Documentation, Support for electronic transaction etc. As the customer, they will look for a whole package together including all the advance features that a mobile phone can use so the search for new technology is the first major reason for advanced cell phones to outrun their competitors. The purpose of the 5G network used for telecommunications may be to respond well to the challenges that a 4G model may have to offer once its widely distributed. In this paper we will see how effectively the packet is scheduled by using Greedy based ant algorithm, instead of using several nodes, use a single cluster Head to communicate with the sink node. We will look at a solution that explains how to successfully use this problem using Network simulator-2.

Keywords*:* Linux NS2 (Network Simulator), network of linked groups, cluster-based network, MIMO Multi Input and Multi output, ACO (Ant Colony Optimization), OPNFV Network Functions Virtualization transformation

1. INTRODUCTION:

The main purpose is to set The ITU sector is changing dramatically since the decade [1], starting with a change in pricing systems that change the speed of data, the latency rate is why demand and supply of technology from consumers has shown tremendous growth. Mobile phones are used by billions of users worldwide in 1945, the generation of zero (0G) mobile phones was introduced. The Mobile phone Service, however, was not officially classified as a cellphone, because they did not support automatic switching of the frequency of the station during calls. 1G (Multiple Access Period) was the first wireless network plan. It's out of date now. Analogs "brick phones" and "wallet phones" are under 1G technology. Next time, 2G has replaced it with 1G. Cell phones receive their first major upgrade while moving from 1G to 2G. These leaks have successfully taken mobile phones from analog to digital [2].

The rise in the number of internets connected devices has led to an increase in network

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activity. These activities must be studied so as to make sure there are no security and privacy threats posed by them. The rules used by routers to filter traffic currently are static and thus are not equipped to deal with the dynamically changing threats of the internet [3]. Thus, a solution must be developed to analyze real-time network traffic to formulate a dynamic set of rules based on the current state

1.1. Objective:

The primary objective is to classify data in to categorize into different types of network controls which include 1) MIMO [10,12] i) End to End network and ii) Relay node. In existing technology, we are using 2G,3G,4G. which in comparison to 5G was less Efficient. Today calls include the smallest size, largest phone memory, fast dial, video player, audio player, camera and more. So far with the development of Piconets and Scatter net [4].

In Bluetooth data transfer it has become a child's play. The creation and introduction of 5^{th} Generation technology in the mobile market place will introduce a new paradigm in the way cellular systems of countries are provided. Just around the corner, the new 5G technology will hit the mobile market with phones being used in China to access and call local phones in Germany.

2. System Model Architecture

2.1. Service Based architecture in 5G system

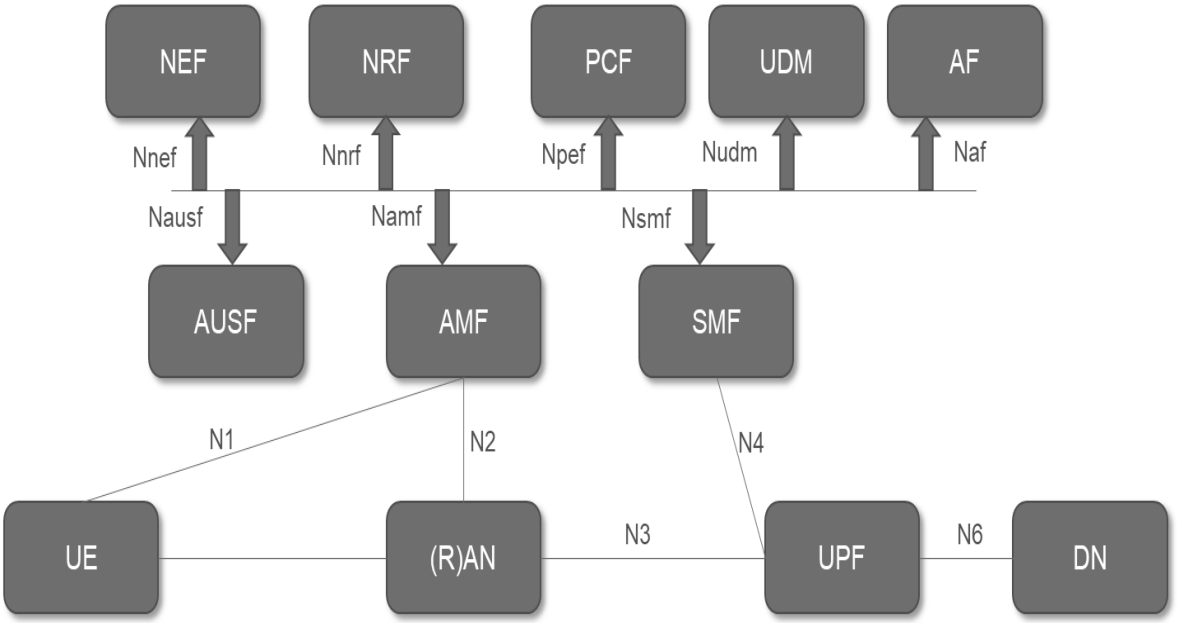

Figure 1: Service based Architecture

By utilizing the core part, most of current-day networks and services is representatively a cloud and Virtualization-based operating system, This is also the example for 5G networks These flat structures are able to be mapped for different purposes[5]. One example of such an operating system is OPNFV.

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2.2. System Flow Architecture

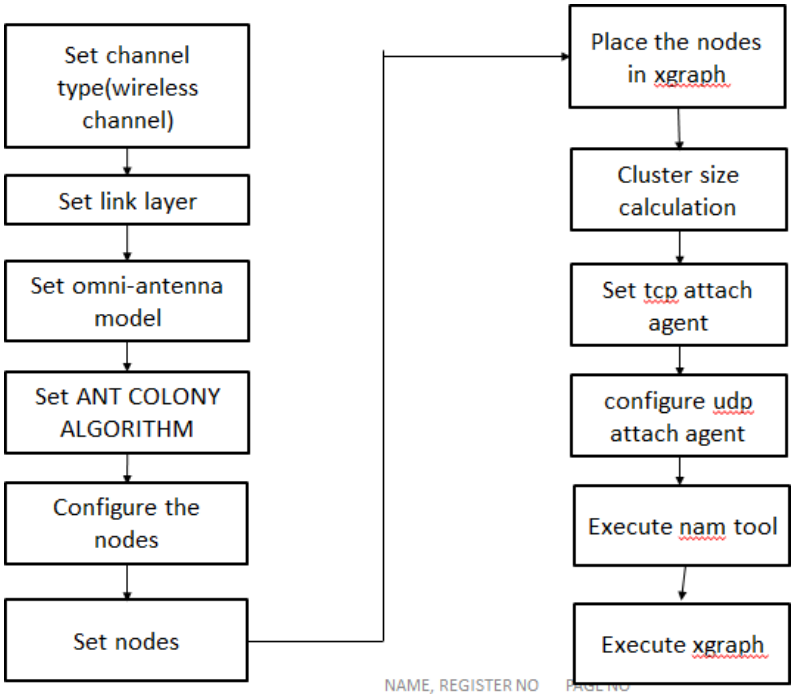

Figure 2: System flow architecture

The above flowchart shows a descriptive overview of how the nodes and clusters are made and transfer of data happen [6,14]. The first step is to set the channel type and algorithm used. The second step is to configure nodes and place in x-graph in cluster formation [11,13,15]. The remaining blocks shows the protocol attachment between different nodes for data transfer. A final step is to execute the name tool and x-graph for simulation.

3. Algorithms

3.1. Ant Algorithm

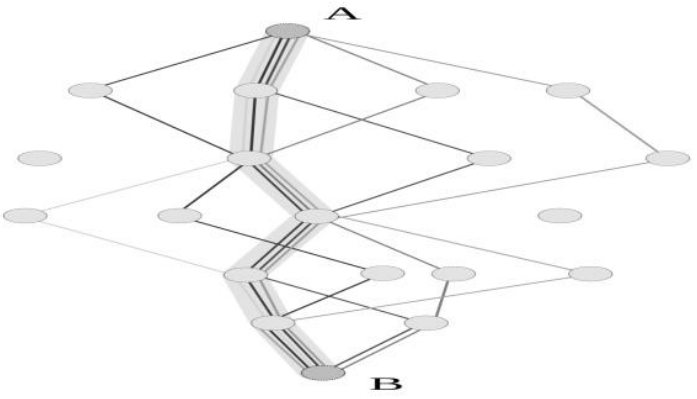

Figure 3: Ant algorithm

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In the ant part under the control of another optimization algorithms, a man-made ant is simple computational person acting for that looks into for good answers to a given optimization hard question. To make a request and part under the control of another algorithm, the optimization hard questions needs to be got changed into the hard question of discovering the shortest footway on a weighted curve on squared paper [9]. In the first step, each ant stochastically makes an answer, i.e.) the order in which the edges in the curve on squared paper. In the second step, the paths discovered by the different ants were made a comparison. The last step is to chiefly of bringing up to the current state the pheromone levels on each edge.

The above stated algorithm is the probability movement from state i to state j

$$p_{ij}^{k}(t) = \frac{[\tau_{ij}(t)]^{\alpha} \cdot [\eta_{ij}]^{\beta}}{\sum_{l \epsilon J_i^k} [\tau_{il}(t)]^{\alpha} \cdot [\eta_{il}]^{\beta}}$$

Figure 4: State from i to j

3.2. Low Energy Adaptive Clustering Hierarchy {LEACH}

LEACH is the first law of the hierarchical network in wireless sensor networks. It has unique behavior like self-renewal, adjustment of range of distance communication, schedule of data transfers for individual locations etc. Overlapping assumptions are performed such as the unstable channel location, the hidden power of the homogenies node and the limited number of cluster heads across all locations. The LEACH operation is divided into a series of equal time intervals. In each of these sessions, head selection, merger and planning processes are completed, respectively, at the very beginning.

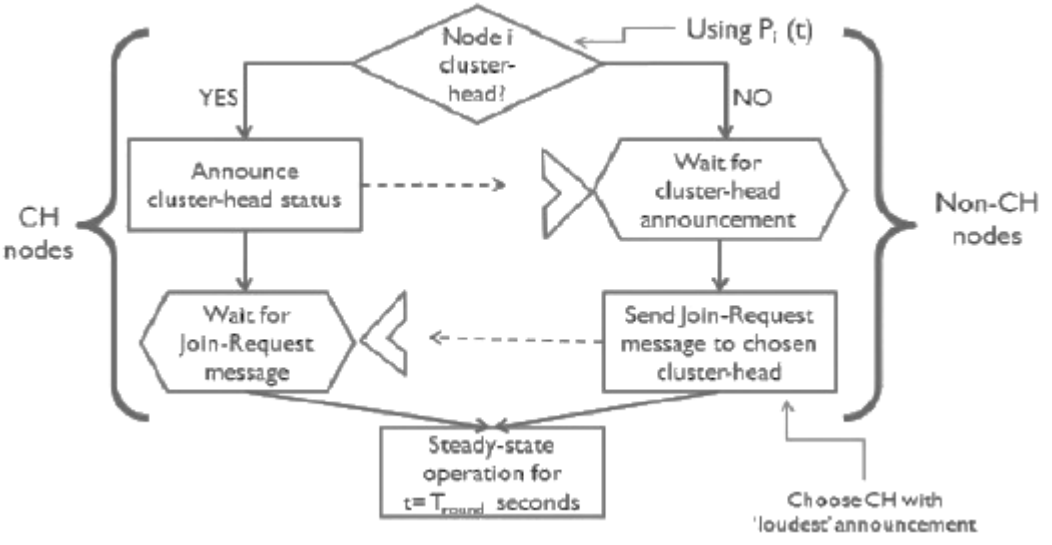

Figure 5: LEACH Display

3.3. System flow of ANT algorithm:

The steps that need to be followed for Ant Algorithm are:

1. Initializing the ACO (Ant Colony Optimization) Parameters.

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2. Constructing solution using probability distribution (Pheromone trail and randomization)
3. Local updating of pheromone is to be done
4.Checks if all ants have visited all cities, else goes back to the loop
5. If yes, Computing the length of optimal path and updates the amount of the pheromone on the optimal path
6. Checks if termination conduction is satisfied.

3.4. Flow Chart

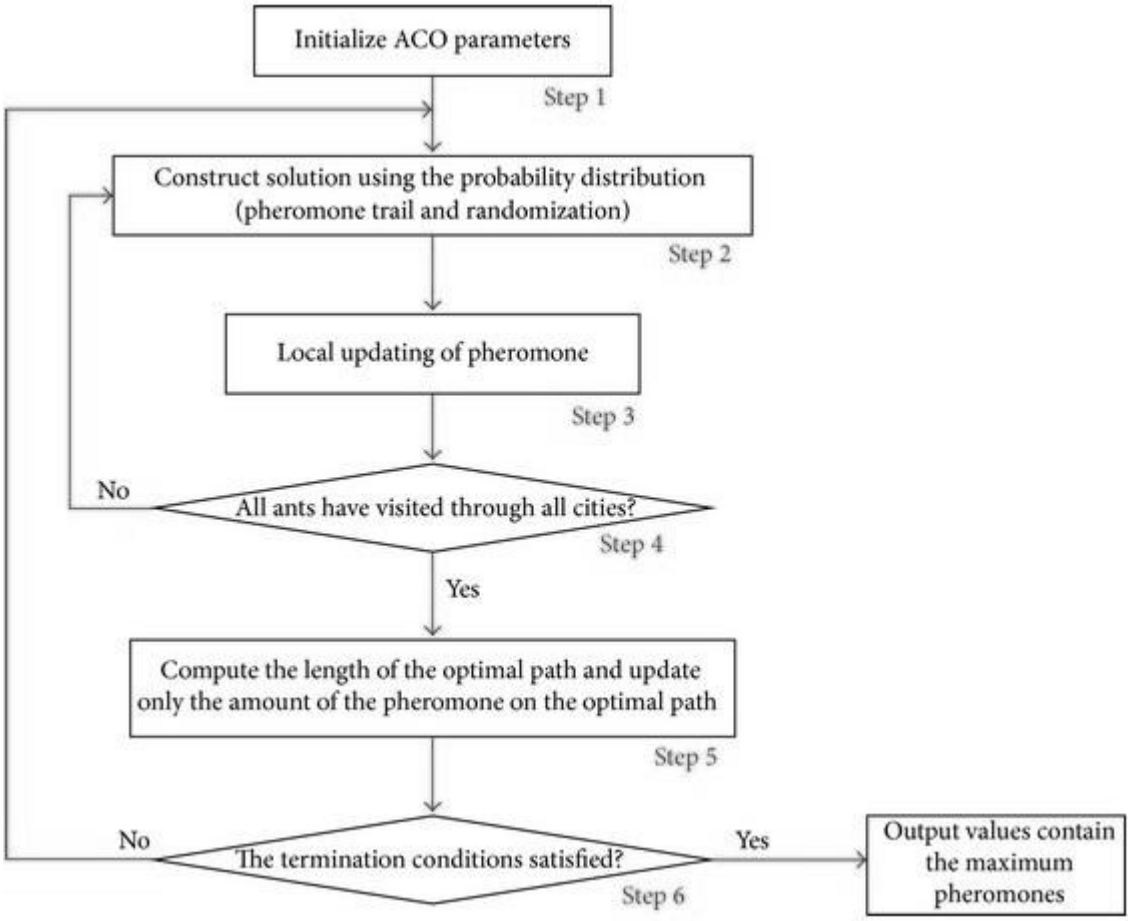

Figure 6: Ant Flow Chart

3.5. Cluster based algorithm

Clustering can also be called as a work of recognizing small groups in the data such that data points in the same small groups(cluster) are alike while data points in different clusters are different. Clustering analysis is carried out on the basis of appearance, characteristics where small groups are identified with subgroups who possess same appearance, features or basic characteristics also used in market segmentation [7] where we try to find out the similar groups based on basic characteristics. Hence, it's known as an Unsupervised Learning Method.

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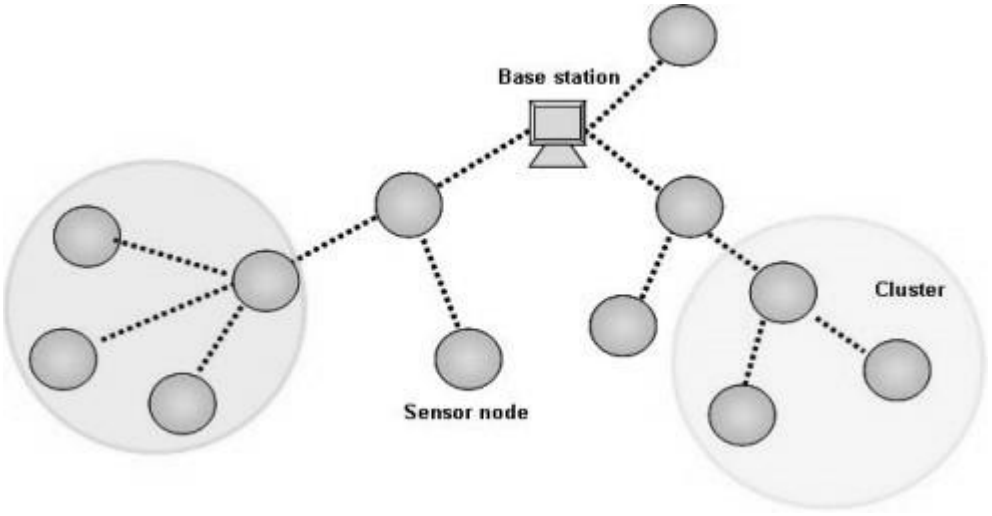

Figure 7: Cluster Based

4. Graphical User interface:

In this below figure we will see the hypothetical introductory presentations here and break down areas into different areas. Each cluster includes neighboring areas between them one will be the responsibility of the group and one area in each group will be the cluster head. The Cluster Load will communicate with all neighboring clusters and send data to the cluster and then each cluster head will exchange data between the cluster header and send data to the sink node in the central and central node. Here the black path between the locations shows the data and the circle around the locations indicates that the energy is emitted by the node.

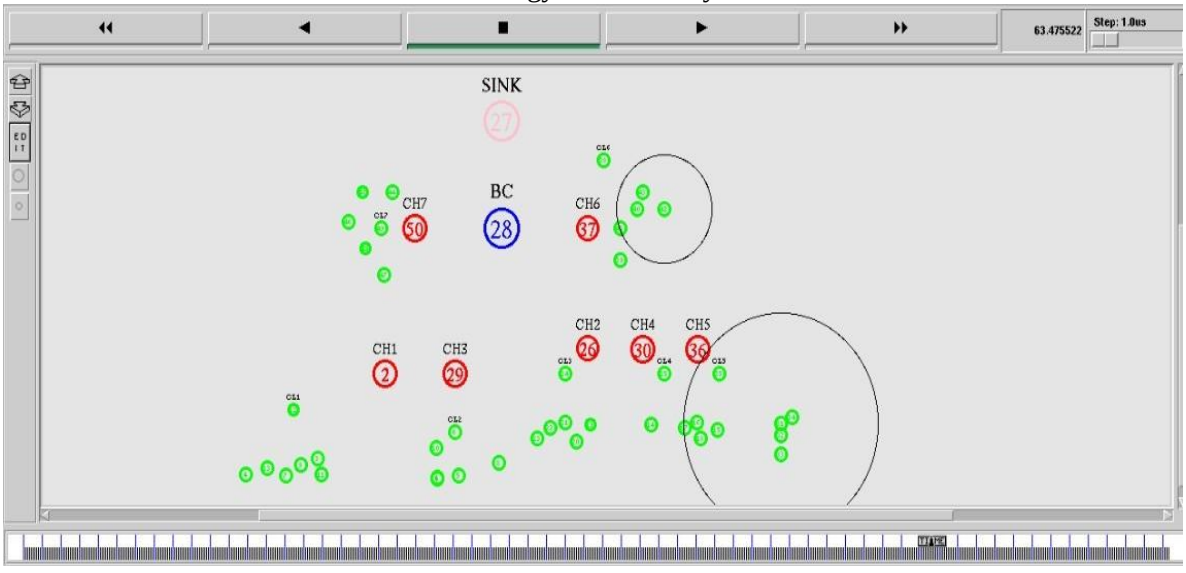

Figure 8: GUI Representation

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5. SIMULATION RESULT

5.1. Through put

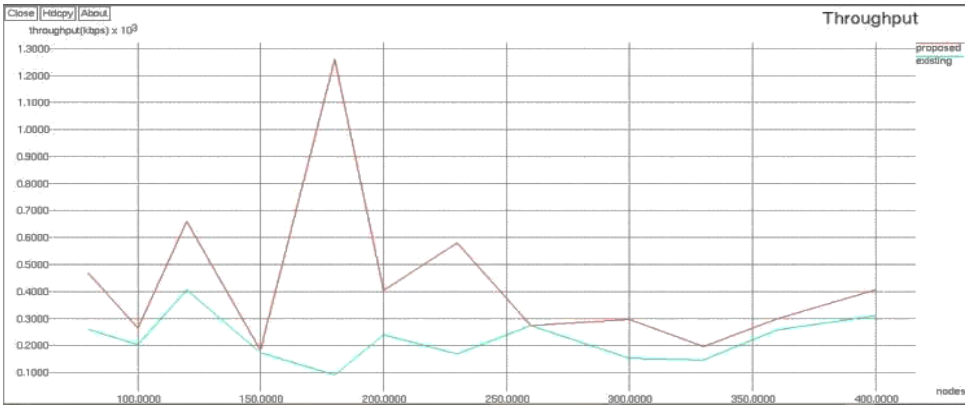

Figure 9: Throughput Graph [width=4]

5.1.1 Inference (Throughput):

Comparison of two systems shown on the x-graph. **GREEN** curve indicates the existing system and **RED** curve indicates the proposed system. Referring to the above figure, the **GREEN** curve shows LOW peaks of throughput values. The maximum value being 0.4000. On the other hand, the **RED** curve has much higher throughput values in comparison to the **GREEN** curve. The maximum reaching beyond 1.2000.

5.2. Delay

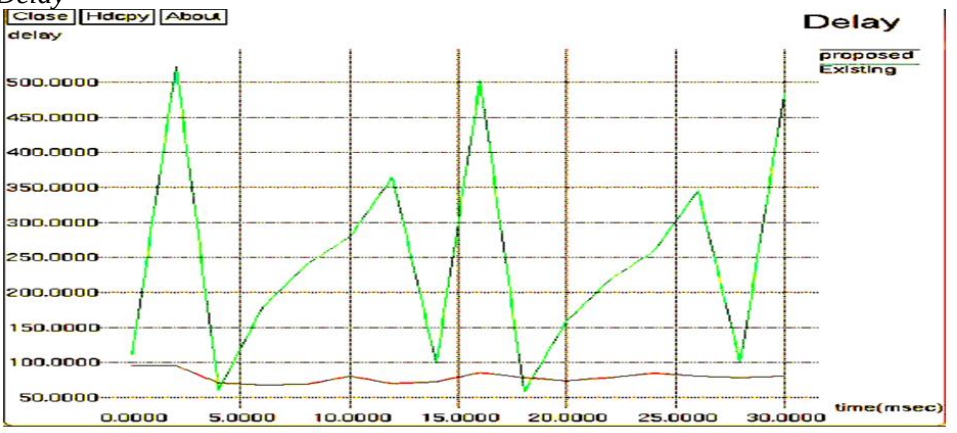

Figure 10: Delay Graph

5.2.1. Inference (Delay): Comparison of two systems shown on the x-graph. **GREEN** curve indicates the existing system and **RED** curve indicates the proposed system. Referring to the above figure, the **GREEN** curve shows that sometimes the delay experienced is very high and at other times it drops down. On the other hand, the **RED** curve is much better in comparison with the **GREEN** curve and delay experienced is almost constant without much fluctuations.

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5.3. EnergyConsumption

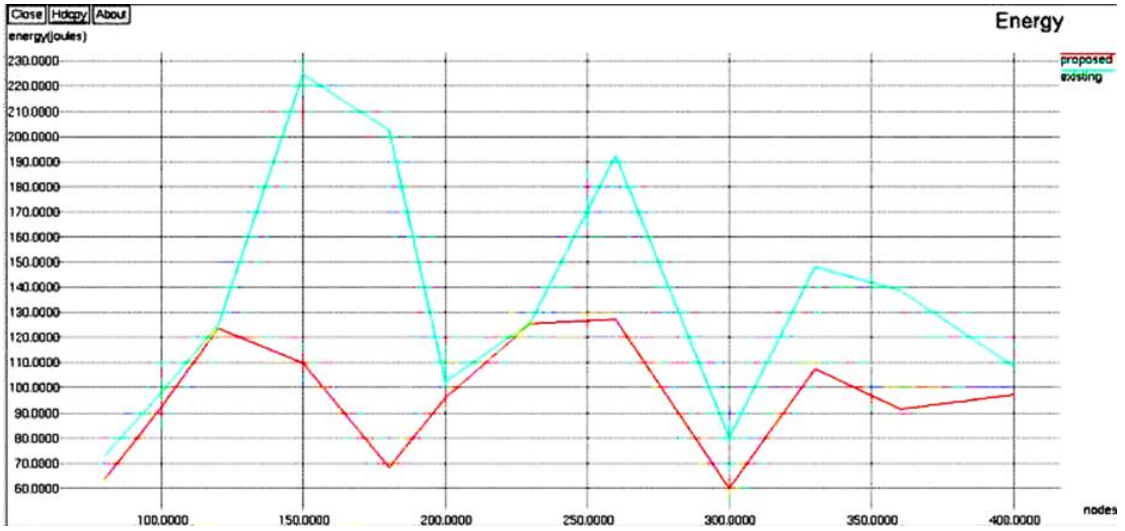

Figure 11: Energy Consumption Graph

5.3.1.

Inference (Energy Consumption): Comparison of two systems shown on the x-graph

GREEN curve indicates the existing system and **RED** curve indicates the proposed system. Referring to the above figure, the **GREEN** curve shows that sometimes the Energy required is very high and at other times it less than the extreme, but it is still high in order to match system requirements. On the other hand, the **RED** curve has much fewer extreme values when compared to the **GREEN** curve thus indicating that the proposed system requires less Energy for transmission [8].

5.4. Packet delivery ratio:

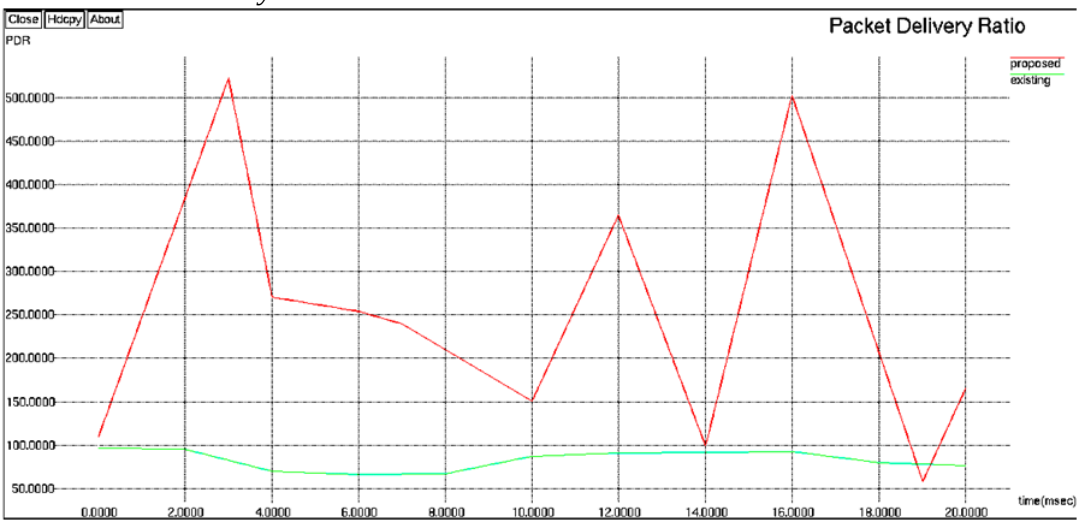

Figure 12: Packet Delivery Ratio

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5.4.1. Inference (Packet Delivery ratio):

Comparison of two systems shown on the x-graph. **GREEN** curve indicates the existing system and **RED** curve indicates the proposed system. Referring to the above figure, the **GREEN** curve which gives a value around 100.0000 indicates a **LOW** Packet Delivery Ratio. On the other hand, the **RED** curve has maximum values above 500.0000 thereby indicating a HIGH Packet Delivery Ratio [12]

5.5. Performance graph of various characteristic nodes

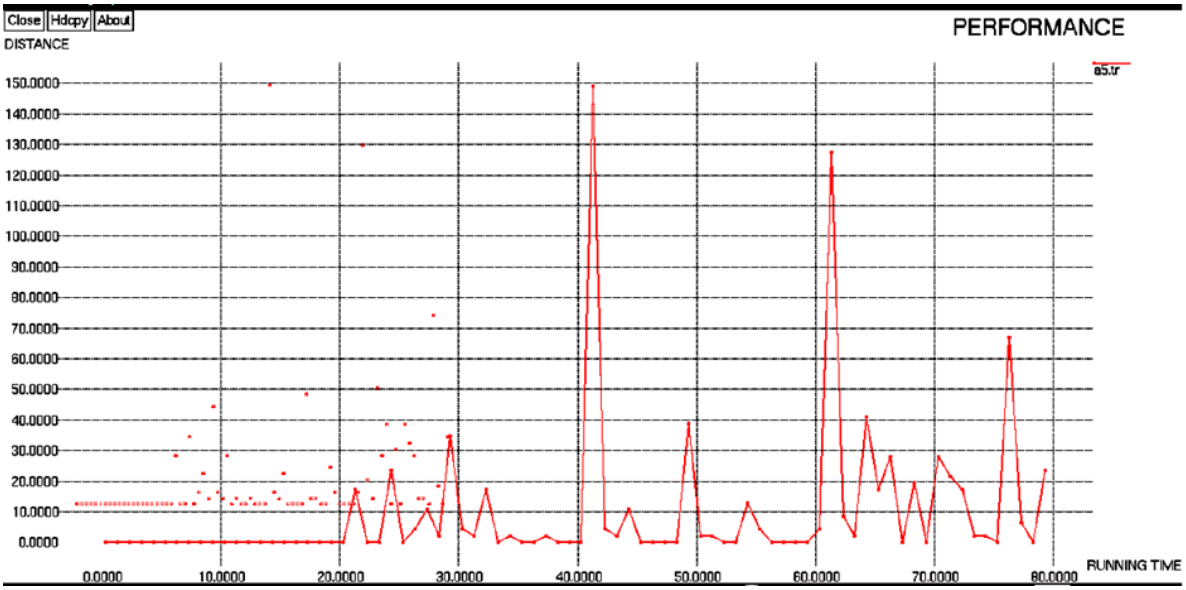

Figure 13: Performance graph of various characteristic nodes

5.5.1. Inference (Various nodes): Zero Indicates no Data transfer between the Client and Server. Peaks Indicate Successful Data transfer

6. Results and Discussion:

Through put: Comparison of two systems shown on the x-graph. GREEN curve indicates the existing system and RED curve indicates the proposed system. Referring to the above figure, the GREEN curve shows LOW peaks of throughput values. The maximum value being 0.4000. On the other hand, the RED curve has much higher throughput values in comparison to the GREEN curve. The maximum reaching beyond 1.2000.

Delay: Comparison of two systems shown on the x-graph. GREEN curve indicates the existing system and RED curve indicates the proposed system. Referring to the above figure, the GREEN curve shows that sometimes the delay experienced is very high and at other times it drops down. On the other hand, the RED curve is much better in comparison with the GREEN curve and delay experienced is almost constant without much fluctuations.

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Energy Consumed (Total): Comparison of two systems shown on the x- graph. GREEN curve indicates the existing system and RED curve indicates the pro- posed system. Referring to the above figure, the GREEN curve shows that sometimes the Energy required is very high and at other times it less than the extreme, but it is still high in order to match system requirements. On the other hand, the RED curve has much fewer extreme values when compared to the GREEN curve thus indicating that the proposed system requires less Energy for transmission.

Packet delivery ratio: Comparison of two systems shown on the x-graph. GREEN curve indicates the existing system and RED curve indicates the proposed system. Referring to the above figure, the GREEN curve which gives a value around 100.0000 indicates a LOW Packet Delivery Ratio. On the other hand, the RED curve has maximum values above 500.0000 thereby indicating a HIGH Packet Delivery Ratio.

7. Conclusion:

In this paper, we have proposed a method for obtaining indirect methods of detection using an algorithm. This method uses the Ant algorithm to identify the stems. This method can be extended to analyze the performance, power consumption and throughput. This protocol proposes a reduction in the number of participating sites in the transfer, transfer aggregated data to the data center, Usable energy consumption, disadvantages of large number of locations, reduces overhead single and multi-hop connections. For existing technologies, we use 2G, 3G, 4G which in comparison to 5G does not work as well as the Cluster method used to validate H- Wireless sensor Networks technology which supports the process of finding a dangerous route. The H-Wireless network supports the movement of a node within a network. In Network architecture 60 small cells are randomly positioned under coverage of three sector base station, each sector macro cells are uniformly and randomly located with a minimum distance of 40 meters. Small cells and macro cells are allocated with small frequencies, the assumption is made that there are 8 small cells on an average, initially user is randomly and uniformly dropped throughout macro geographical area. We dealt with the hard question of facts getting together in the things not fixed BS general condition thing talked of to the sensing facts needed to be gathered at a given details of loss (waste) of time. We offered a clustering-based rules through discovery by experience algorithm for discovering a line of motion of the things not fixed BS to balance the power for a given time using up among sensor net-work points. The algorithm lets the BS to go to all mass, group heads within a given details of loss (waste) of time. We put examples on view of by act as if something done to see the effect that the use of clustering into groups with a things not fixed BS can increase the network for all one's existence importantly. In future, chief place can be given to get done 100% amount covered with least possible or recorded number of BTS, the learning process of the 100% amount covered using different most good selection look for techniques also present several interesting questions. These problems are over complex; therefore, their answer can be taken into account as a very good sign of for the possible unused quality of the nature given impulse to algorithms including man-made part under the control of ANT algorithms.

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