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An Enhanced Perceptive Queuing Technique (CBCRTQ) for Traffic Management in VoIP Over MANET

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Abstract

*Traffic management in the VOIP transmission is the most important criteria and issue (to be maintained the packet**).** The traffic maintains packets and data as a source of outcome for VoIP (QoS) over Manet background. Queuing is one of the most important mechanisms in traffic executive. Mobile Adhoc network (MANETs) present a good platform for the fast deployment of VoIP services in many application scenarios. Ad hoc networks consist a set of identical node that moves freely, independently and communicate with other node via wireless links, the main challenge in extreme sensitivity to delay and packet loss in Voip over Manet. In this research a new algorithm proposed which enhance the performance of traffic load in VOIP carryover MANET environment. Through a simulation and mathematical expression we analyze and evaluate QoS parameters, in the existing method there is no load balanced queuing mechanism and lack in cluster selection prototype. Hence researcher proposed a new Class Based Cluster Round Trip Queue (CBCRTQ) algorithm for VoIP (QoS) over MANET. The main objective of this algorithm selection of cluster heads form a virtual backbone and may be used to route packets for nodes in their cluster. There is a need of traffic load balance at Cluster Round Trip methodology in VoIP, Simulation experiment makes clear that the future algorithm does provide longer cluster head selection and duration with traffic load-balancing.*

Keywords*: VoIP, QoS, CBCRTQ, MANET, ADHOC*

1. Introduction

Ad hoc networks (also referred to envelope radio networks) consist of nodes to be in motion generously and converse through other nodes via wireless relations. One method to hold well-organized message stuck between nodes which expand wireless back planning. As all nodes are the same in their capability, convinced nodes are chosen to form the cluster heads are nodes that are vested with the liability of steering messages for all the nodes within throughout the last two decades, [1] knowledge has obtained for the possible stage which amplify in network speed, the blast satisfy the accessibility and the novel armed forces, such as stream media and file distribution which has multiple the quantity of network traffic. In modern networks, not all packet are treat equally: diverse priority are assign to packets, and the network employ preparation algorithms which take into explanation packet priorities in the procedure of selection and offering thus different quality-of-service (QoS) levels to packets of different priority classes [7].

2. Related Work

Proposed to Ad hoc networks are a collection of nodes which move freely and independently and communicate with other node from side to side wireless relations. These networks are logically represented as a set of clusters by grouping nodes which are in close proximity with one another. Cluster heads form the backbone and this cluster

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head is used to nodes in the cluster each router in the network and must implement some queuing discipline that packet are buffer as coming up to be transmit. So Queuing is one of the important mechanisms in traffic organization. In this paper a variety of obtainable queuing algorithms are explain first in first out (FIFO), [5].

3. Problem Identification

Cluster Mobile Ad Hoc Networks (MANETs) has a lot of reward compare to the customary network. The drawback is selection of the cluster head in selection mechanism of huge traffic scenario, But the very vigorous and unhinged natural world of MANETs create it firm for the cluster base direction-finding protocols to split a mobile network into cluster and will power of cluster heads for every cluster the procedure of separating the system into consistent substructures is called clustering and the unified substructures are called clusters. The cluster head (CH) of each cluster act as a manager within the base not to analysis the packet overflow and fading in particular Manet environment. [3]

4. Proposed Overview New Class Based Cluster Round Trip Queue (CBCRTQ) Algorithm for VoIP (QoS) over MANET

The process of in-between the system into united substructures is called clustering and the substructures are called clusters. The cluster Weight head (CH) of every cluster act as a manager within the base. Each CH acts as a provisional base position within its zone or cluster. The group of network nodes into a figure of overlap clusters **are** the major idea at the back clustering. Each router in the network must implement some queuing discipline that governs how packets are buffered for transmitting. So Queuing is one of the significant mechanisms in traffic organization. [12]

So we propose a predefined time base quantum Round Trip scheduling methodology, the method is implementing in our queuing used to upgrade or demote process from one queue to another. [3]

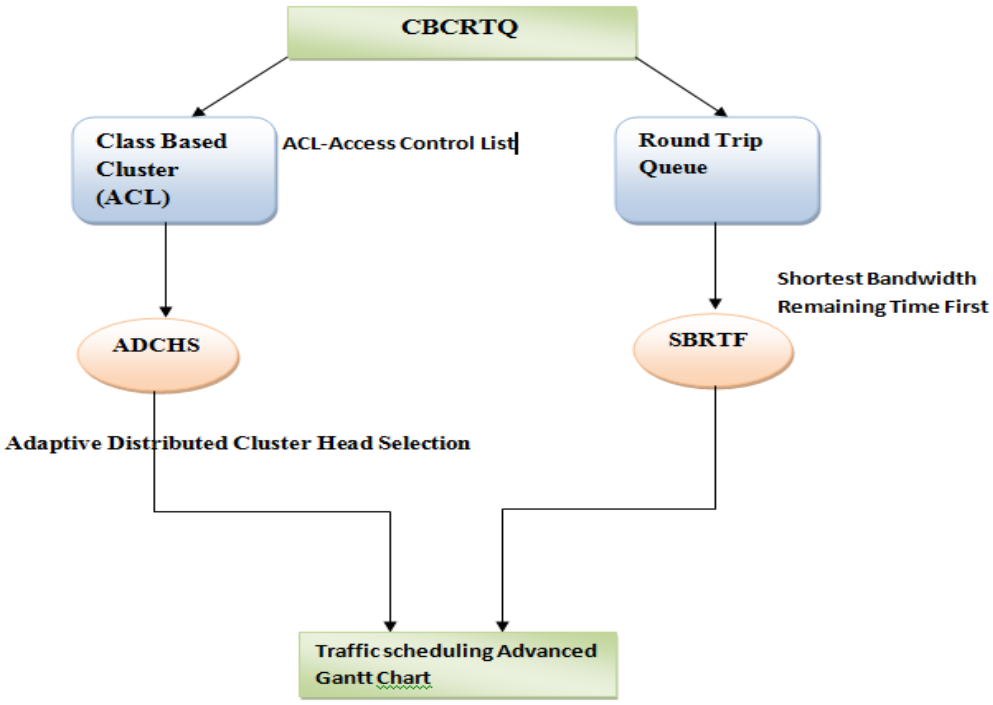


Figure 1. Classification Diagram of CBCRTQ

4.1. Proposed Algorithm Working Mechanism

4.1.1 Class Based Cluster Round Trip Queue (CBCRTQ)

Based on Voip traffic scenario going to design a new high end traffic scheduling and balanced node flow in manet environment, our ultimate aim is to provide a time saving and cluster head selection to guide or give a anti-collision path mechanism in real time Voice over internet protocol. [6]

4.1.2. Class Based Cluster

CBC which defines traffic classes based on cluster match scenario including protocols, Access control list (ACL) and input node interface.

A queue is reserved for each class and ultimate traffic belonging to a class directly based on cluster head selection. The Class is mainly depending on bandwidth and maximum buffer capacity in our queuing. [12]

4.1.3. Adaptive Distributed Cluster Head Selection (ADCHS)

It is a modified description of the Cluster Identifier algorithm. Each cluster select its cluster skull from its neighboring nodes has the deprived ID. In this algorithm every node can decide its cluster and only one cluster, and transmit only one message. The communication is told by dissimilar group of cluster apparatus in to allocate the IP direction-finding in over all traffic scenarios. [5]

4.2. Round Trip Queuing

The queue is mainly designed for time sharing system and reduces the time delay and packet over fading to overcome the drawback of uncertain time-varying traffic load in low efficient end-to-end congestion control. The proposed technique which ensures the time and buffer management. [8]

4.2.1 Shortest Bandwidth Remaining Time First (SBRTF)

Which provide a minimum average waiting time for a given set of incoming node packets. This mainly depend on Arrival time and Burst time finally calculate overall average waiting time, the main advantage is multi-level queue scheduling is obtained successfully. [7]

4.3. Traffic Scheduling Advanced Gantt chart

Gantt charts provide a standard format for displaying traffic schedule information by listing node activities and their corresponding start and finish voip flow in a frame format.

5. Functional Diagram of Proposed Algorithm

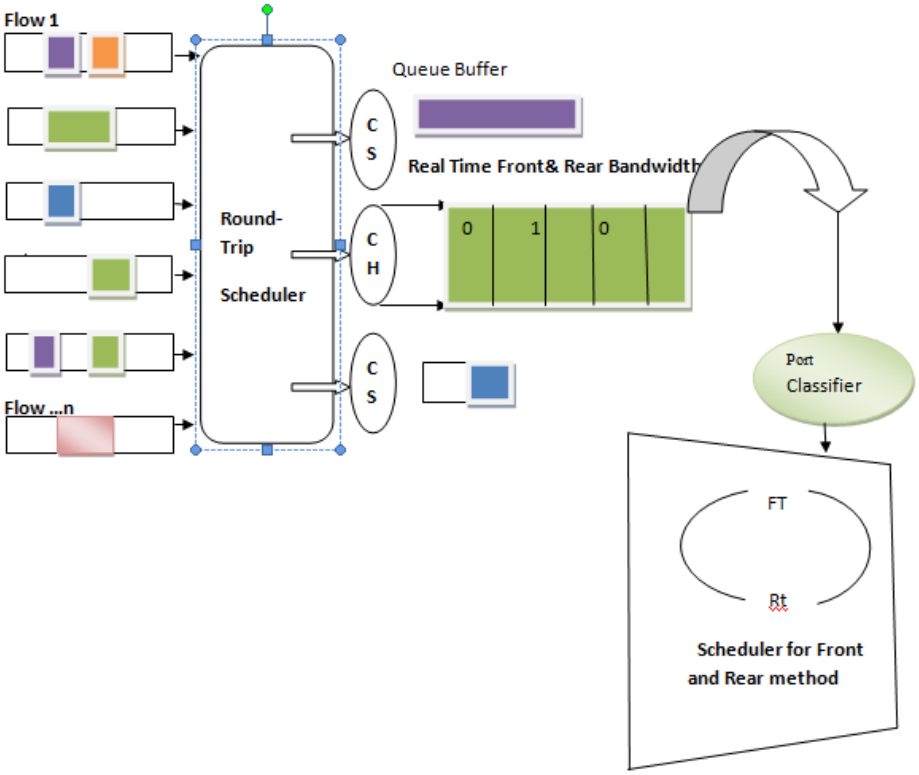


Figure 2. Functional Diagram of Proposed CBCRTQ

The amount of data flow packet in Flow 1…..n which ensure the delay experienced by packets in a given queue is determined by a combination of the rate packets are placed into the queue. The mechanism of Round trip scheduler Use a timer to reason break off following a prearranged occasion. Preempts if task exceeds its quantum value multi level queuing has its scheduling properly in time and bandwidth specification in different scenario [2].

Real time scheduling classifies both system Hard and soft required to complete a critical task with in a guaranteed. A queue differs from a stack in that its placing and taking away routine go after the first-in-first-out (FIFO) code to conquer this move on to proposed queue rudiments may be insert at any time, but only the constituent which has been in the queue the longest may be removed. Elements are inserted at the rear (en queued) and removed from the front (de queued) [9].

5.1. Message Format Proposed Protocol

Adpt_Config_Request: the communication is used to create an Auto pattern services request after getting a Discovery note.
Cluster_intiliazed: indissimilarmap-reading mechanism
Sele_Cluster_Head: collection of Cluster Head in Ipv6 route Mechanism…
Config_Request: this message is used to ask for an On-line joint IP address and key options.
Cluster_Alert: this message enable new when a hateful node is exposed along the node.
Buffer Stack: to check the space portion

6. Proposed Algorithm CBCRTQ New Cluster Head Formation

1: Income Nodes Packet –Ni
2: Check Node Sequence – Ns-#
3: Check Selection cluster head highest Bandwidth and priority Seq-Ps #
4: if
Seq # --→ all the nodes
5: then
Check Black List
If
Black **List is un-check**
Then
Select Cluster Head
Else
Reject
6: endif.

6.1. Class Based Cluster Formation Algorithm

Input: Set of node
Output: Set of adaptive Cluster
Begin Cluster Round Trip selection =1*/
Repeat
Select an Ut most Packet node which belongs to cluster traffic which is 1 hop distance apart from other participate nodes with a small length.
Do
N=ni; C=CF (Cluster Formation)
Calculate a cluster the Class based Bandwidth head selection.
While ni = nj
Cluster is formed with matching lying with in cluster.

6.2. Algorithm Formation for Shortest Bandwidth Remaining Time First (SBRTF)

SBl-----→Shortest Bandwidth for long packet flow in traffic VoIP
DBs----→ Distance Bandwidth estimation for Buffer capacity
Time $_{arrival}$--→ loop counter for time trip Estimation
Evaluated ALCF (Adaptive Link Cluster Formation) distance estimation in Bandwidth separation in node to node link.
While
Time – arrival value at dis T A
/**********Remains….go while as cluster Head**********/
End while
If (Time< ALCF B1>B2>B3) = CHS (Cluster Head Selection)
/********the cluster formation is true**********/
Else
{
Both B1 & B2
Bandwidth for long in estimation…
End
End if

6.3. Voip traffic Load –Balancing code Format

Clusterhead Load-Balancing
/*******If a node is a cluster head check to see if has exceeded ******/

MAX_DATA is set and ordinary node.
Cluster_load_balance()
If(Clusterhead==My_Node_ID)
Correct
If (Trip scheduling in order)
Else
Packet Drop takes place…..

6.4 Algorithm Formation of Round Trip in Cluster

Adaptive initial message
If class label (L) =U // ********L = Cluster Label*****//
{
If y€N_1 (L) and (label(y) =H or y==1
{
Label (L) =D;
h(L)=h(y)+I;
Next (L) = y;
}
Else
{
W (L) = s (L) +t (L)*deg (L);
If w (L)>w(x) N1 (q)
{
Become_ head (L)
}
Else let q be the node with w (q) =max w(x)
{
End
}

6.5. Round Trip Scheduling Mechanism:

A predetermined time quantum is mention in trip function depends on process time and Burst time.

Process on Node	Burst Time Flow	Two units	Two Units	Two Units	Delay Calculations
N1	6-2	4-2	2-2	0	(10-2)+(17-12)=13
N2	5-2	3-2	1	0	2+(12-4)+(19-14)=15
N3	2-2	0	empty		4
N4	3-2	1	0	Empty	6+(14-8)=12
N5	7-2	5-2	3	0	8+(15-10)+(20-17)=16

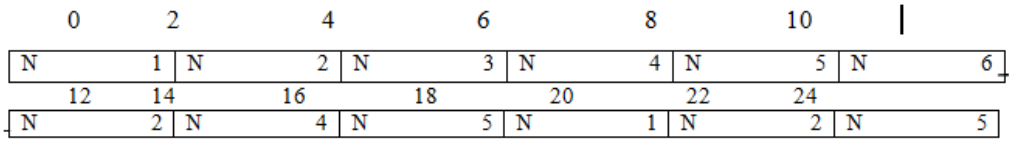
Some set of process is submitted to Class based Cluster Queue and the respective Burst time are mention here so Node N1 burst time is 6…

Here we assume time quantum for two units

To calculate the Average for time Delay

(13+15+4+12+16)/5 = 12

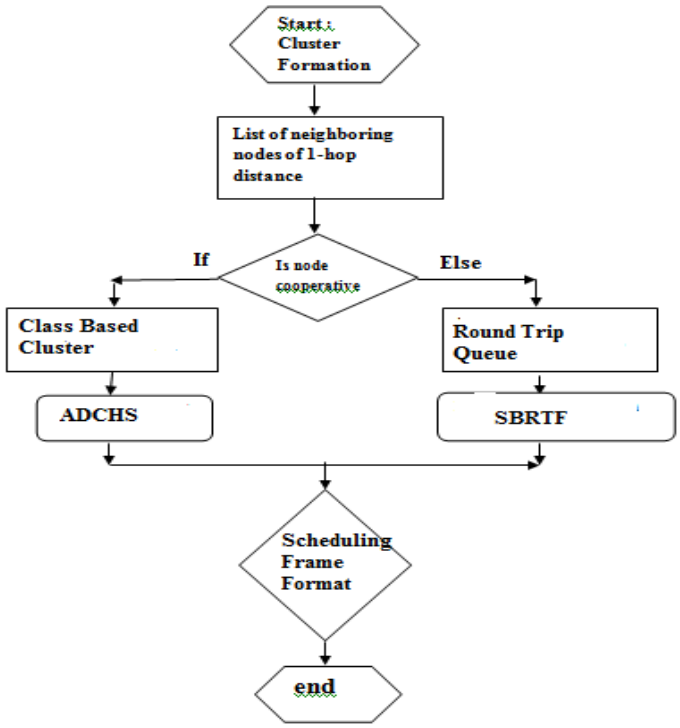
This Average Waiting time Delay in Round Trip
Gantt chart



All the Process arrives at t=0

If the Node exceeds one time quantum it be pre entered and put back to ready trip Queue Gantt chart is used to plot the chart in ready queue.

7. Flow Chart CBCRTQ Algorithm:



8. Simulation and Results

Simulation based research behaviorial is examined for assess the presentation of the proposed algorithm. Nowadays it has a lengthy conservative to be a valuable tool in many areas where logical method is not suitable and testing is not possible. The main stream approach in the WSN is the research group of people more often than not to follow the growth, imitation, and publish procedure, and WSN publication normally include performance simulations that contrast different protocols [3]. In this research also, simulations were also used to test the proposed aggregator algorithm and power efficiency in WSN [3].

8.1. Network Simulator

Network Simulator2 (NS2) is a discrete-event simulation platform written in C++ programming language and Scripting language Object oriented Tool Command Language (OTCL). Consumer write an OTCL writing that define the network (number of nodes, links) (sources, destinations, type of traffic) and which procedure that is used. This script is used by NS2 during simulation. The results of the imitation is an output trace file that can be used to do data processing (calculate throughput, delay etc.) and imagine the imitation with program called Network Animator (NAM). NAM is a visualization tool that visualizes the packet as it propagates through the network. An impression of how simulation is done in NS2 [21].

8.2 Real time Simulation Overview

Simulation in NS2 is which consists of generating the following input files to NS2. A scenario file that describes the movement pattern of nodes. A communication file that describes the traffic in the network [6].

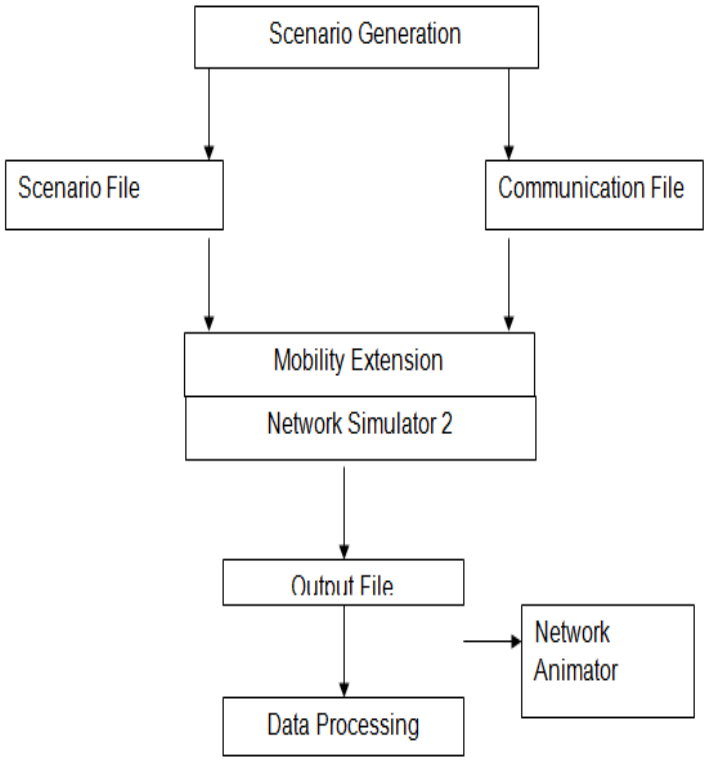


Figure 3. Data Processing

These files can be generating by totally randomized movement and message pattern with a script. These files are then used for the simulation and as a result from this, a trace file is generating as output. Prior to the simulation, the parameter that is going to be traced during the simulation must be chosen. The trace file can then scans and analyze for the various parameters that can be calculated. This can be used as data for plots and to imagine the simulation run with NAM [12].

Table 1. Functions used for Programming

Function Name	Functionalities
Init_AODV( );	Initial Routing mechanism
Select _Cluster( );	Selecting Cluster using WSN module
Power_Down_Mode( );	Analysis Power and Energy module
Ch_B( );	Cluster to Bandwidth initialization
AD RTS_Msg_Tx( );	Transmission of Adaptive Round Trip Schedule
CBCRTQ _Init( );	Initialization of **CBCRTQ** protocol
Read_MAX Packet( );	Reading of maximum Packet in node
Compare ( );	Look for Cluster and Bandwidth
Decision( );	Make a decision on transmission
Reconfig_CH( );	Reinitialize / Change the CHS commands

The ADCHS & SBRTF algorithm was developed using the above functions using queuing and cluster logic. The life time of the network can be calculated depending on the energy consumption of the each node at each and every phase.

Table 2. Result Performed in CBCRTQ

No of nodes	20
No. of Flows	20
Propagation Model	Two-ray Ground Reflection
Area Size	1000 m X 1000 m
Radio Frequency	2.4 GHz
MAC	IEEE 802.15.4
Simulation Time	600 sec
Transmission Range	250 m
Routing Protocol	**CBCRTQ** protocol
Traffic Source	CBR
Packet Size	512 Bytes
Radio Transmitting Power	7.88 dBm
Radio Receiving Sensitivity	-91 dBm
Radio Receiving Threshold	-81.0 dBm
Initial Energy	100 J

Performance Metrics Network Animation (NAM)

The performance of CBCRTQ is compared with the Cluster-based protocol, according to the following metrics

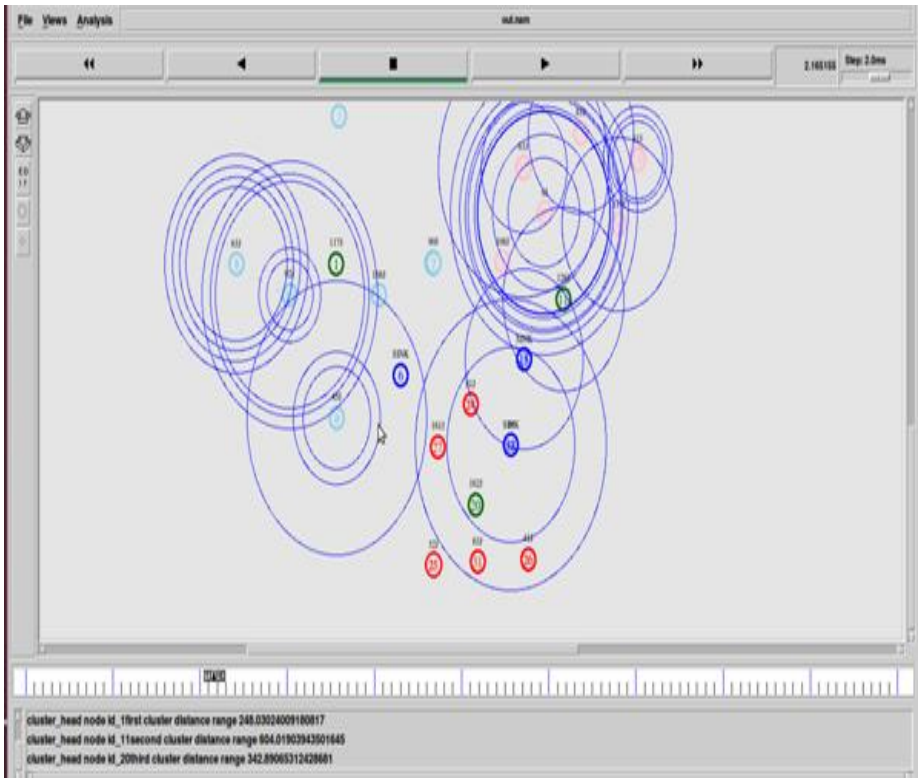


Figure 4. Initial Stage of VOIP Traffic Flow in Cluster Mechanism

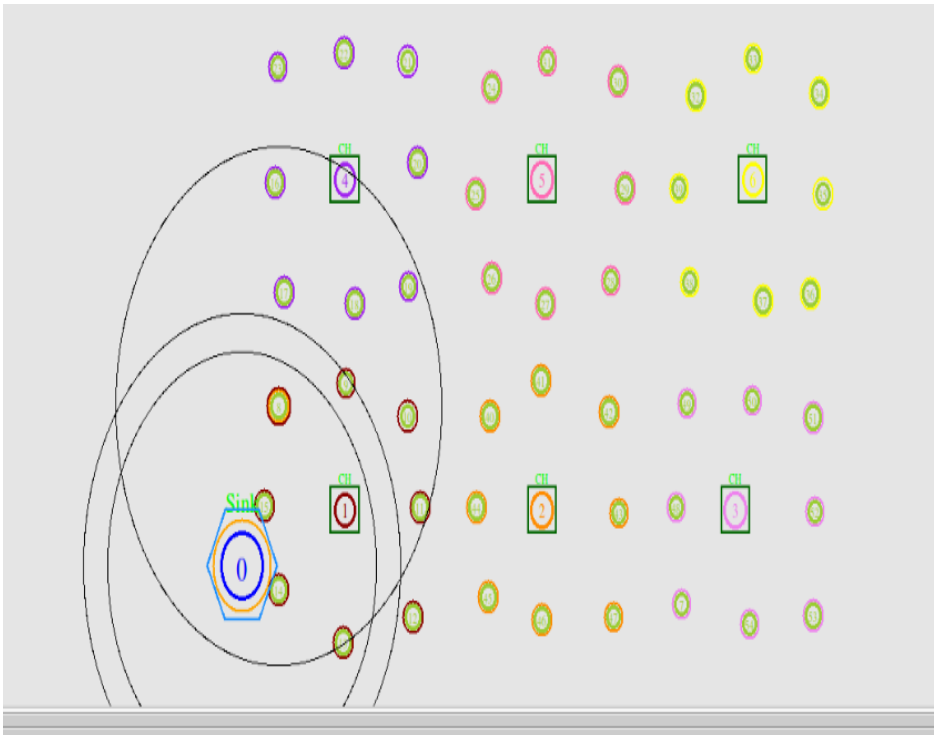


Figure 5. Cluster Head Selection in NAM Window

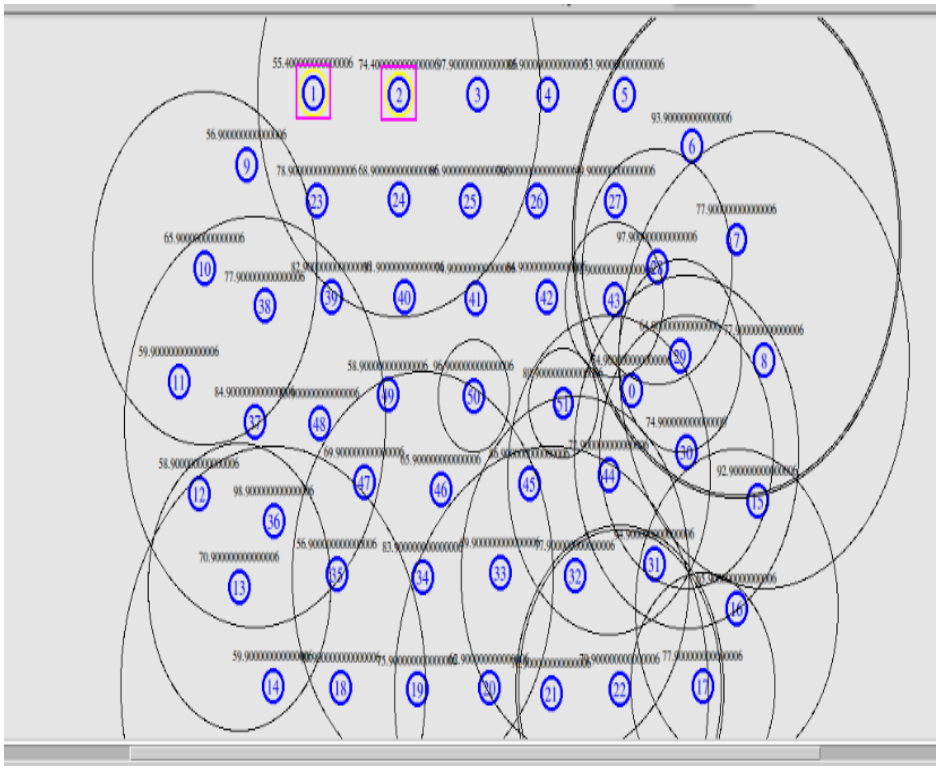


Figure 6. Class Based Cluster in Round Trip Mechanism in NAM Window

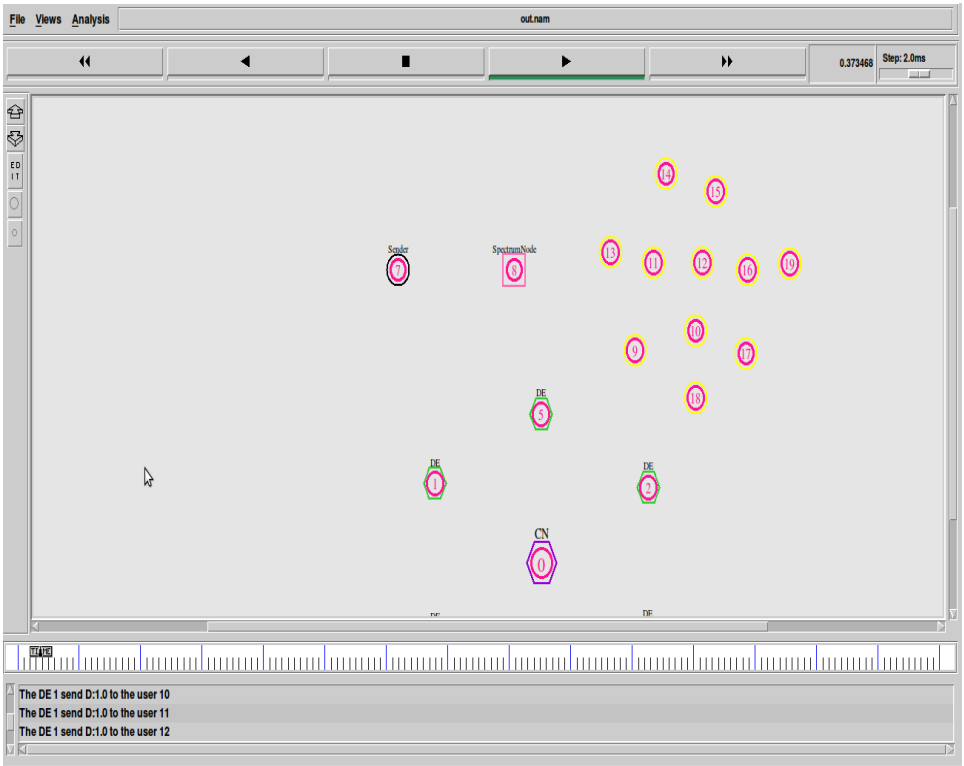


Figure 7. Class Based Cluster Round Trip Queue Separations

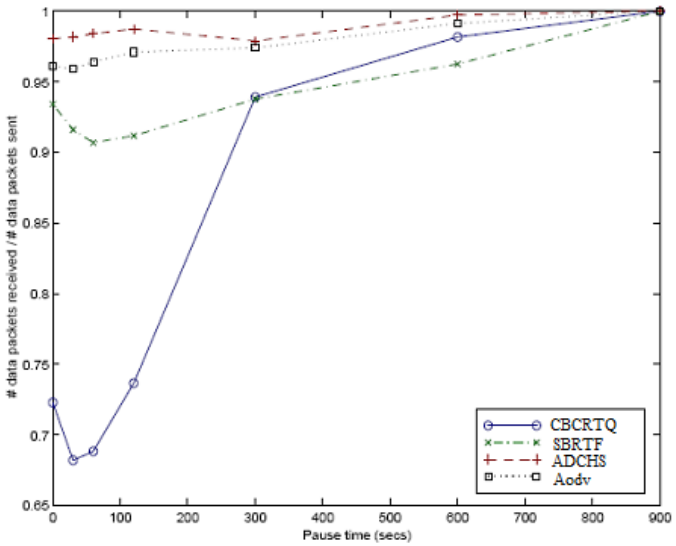


Figure 8. Packet Delivery Ratios in Proposed Mechanism

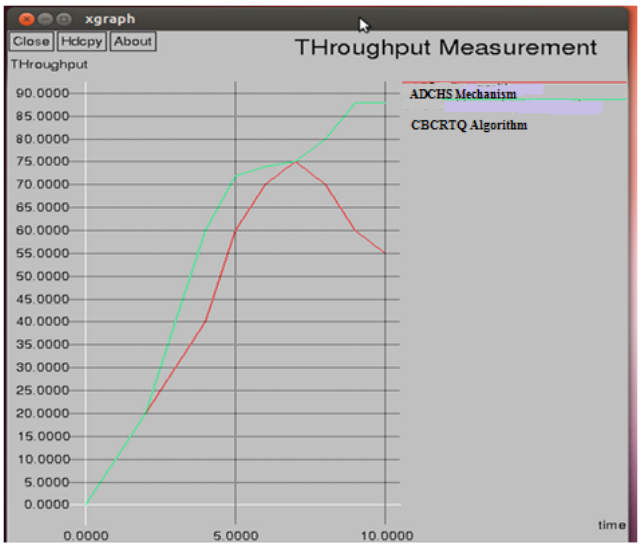


Figure 9. Throughput Graph Analyses for CBCRTQ Algorithm

9. Conclusion

The paper explains about the calculation of the average time consumed by each and every nodes for's' time. At each time nodes get the data packet messages from the Cluster Head (CH) which makes the node to change the current state from the sleep to wake up mode. The bandwidth between the Cluster Head (CH) and destination node is calculated intelligently. The set up was tested for smaller number of nodes and the same could be replicated for 'n' number of nodes. Thus the reduced traffic in VoIP time consumption of wireless sensor node increases the network life time since the traffic is not been used for the whole time instead it is used for the particular time reduced in the new proposed algorithm Class Based Cluster Round Trip Queue (CBCRTQ) for VoIP (QoS) over MANET.

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