Dynamic Channel Allocation Mechanism in Wireless Network for Improving the Quality of Service

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Abstract—Wireless communication and mobile computing are rapidly growing segment of the communication Industry, with the potential to provide low-cost, high-quality, and high-speed information exchange between portable devices. The random selection of free data channels in Dynamic Channel Allocation can balance the data channels' utilization. CACAO method was the final best Method for channel assignment, but it also has some issues, in that method have a random channel assignment it can reduce the QoS in channel assignment. Based on those issues we can develop the new method for channel assignment named as ATIM (Avoiding Traffic and Interfere Method) channel. In Scheduling we can Find the Delay and the Throughput for each channel by using Locations of the nodes and Channel state information (CSI) then Assign Minimum Delay and Maximum throughput Channels. In the Gather Statistic gathers the information's about using channels, free channels and Traffic Information's. In Interfere Calculation calculate the Interfere for each channel. In the Channel Adjustment select the best channel for that node and Switch to that channel. ATIM is a good approximation solution in terms of delay and processing time.

Keywords— Wireless communication, mobile computing, CACAO

I. INTRODUCTION

One main issue in cellular system design reduces to one of economics. Essentially we have a limited resource transmission spectrum that must be shared by several users. Unlike wired communications which benefits of isolation provided by cables, wireless users within close proximity of one another can cause significant interference to one another Each cell is allocated a portion of the total frequency spectrum. As users move into a given cell, they are then permitted to utilize the channel allocated to that cell. The virtue of the cellular system is that different cells can use the same channel given that the cells are separated by a minimum distance according to the system propagation characteristics; otherwise, intracellular or Co channel interference occurs. The minimum distance necessary to reduce Co channel interference is called the reuse distance. The reuse distance is defined as the ratio of the distance, D, between cells that can use the same channel without causing interference and the cell radius, R. Note that R is the distance from the center of a cell to the outermost point of the cell in cases when the cells are not circular.

Channel allocation deals with the allocation of channels to cells in a cellular network.

II. PROPOSED SYSTEM

From the Survey (Channel Assignment Schemes for Infrastructure-Based 802.11 WLANs: A Survey) LCCS, MAX Chop algorithm and H min max are the best methods for channel allocation. The new method CACAO proposed by XiaonanYue (A Distributed Channel Assignment Algorithm for Uncoordinated WLANs). He can compare the performance of CACAO with three other channel assignment algorithms namely, LCCS which is commonly implemented on APs, MAXChop algorithm and Hminmax algorithm. CACAO Method was the final best Method for channel assignment, but it also have some issues, in that method have a random channel assignment it can reduce the QoS in channel assignment. Based on those issues we can develop the new method for channel assignment named as ATIM (Avoiding Traffic and Interfere Method). In ATIM method has four steps: Scheduling, Gather Statistics, Compute, Interference, Switch to minimum traffic channel. In Scheduling we can Find the delay and the Throughput for each channel by using Locations of the nodes and Channel state information (CSI) then Assign Minimum Delay and Maximum throughput Channels. In the Gather Statistic gathers the information's about using channels, free channels and Traffic Information's. In Interfere Calculation calculate the Interfere for each channel. In the Channel Adjustment select the best channel for that node and Switch to that channel. ATIM is a good approximation solution in terms of delay and processing time. Simulation results also show that ATIM achieves (on average) 95 percent of the delay performance. This Interfere method is used to reduce the traffic based on the delay and throughput. The proposed approach is very close to the best end result by using the interfere algorithm.

III. SYSTEM DESCRIPTION

The overall architecture of the proposed system, in Scheduling we can Find the Delay and the Throughput for each channel by using Locations of the nodes and Channel state information (CSI) than Assign Minimum Delay and Maximum throughput. In the Gather Statistic gathers the information's about using channels, free channels and Traffic Information's. In Compute Interfere calculate the Interfere for each channel. In the Switch to select the best channel for that node and Switch to that channel. The distributed CACAO algorithm utilizes information gathered by APs and clients on interference conditions to minimize the local objective function by switching to a channel that has least expected interference. As mentioned, the algorithm is very simple, and does not require communication among neighboring APs. It adaptively settles to some minimal interference among the BSSs depending on network traffic. We illustrate CACAO algorithm for open Algorithm 1. Firstly, every AP runs the initialization routine when it boots up. During boot-up period, each AP randomly assigns itself to a channel chosen from the k non-overlapping channels, because there is no previous traffic information gathered to decide on channel assignment. Then, an AP periodically runs the optimization routine. It computes the sum of the expected interference level with regard to each nearby BSS for each channel to be used for the next time interval.

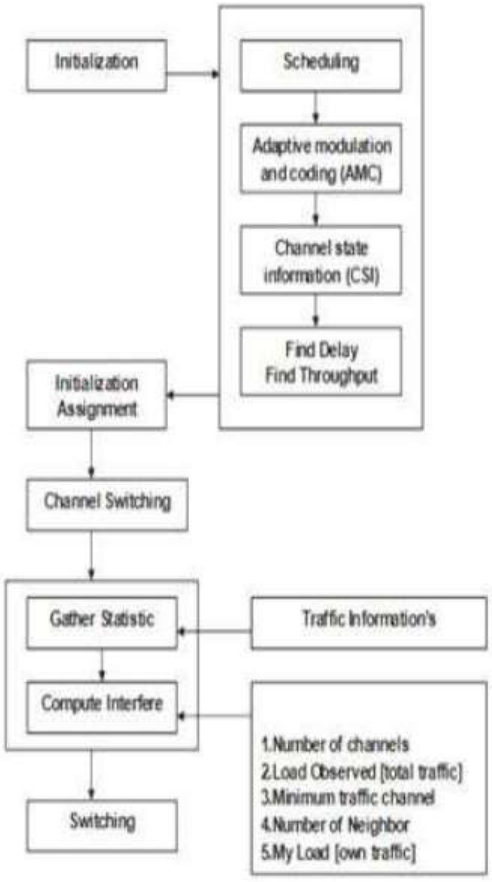


Fig1. System Architecture

The distribution of throughput per client of each algorithm is Since LCCS algorithm does not consider traffic pattern and only assigns channels at the very beginning, the distribution of throughput is not normal. There are many clients that experience poor performance while some nodes experience very good performance. On the other hand, MAX Chop algorithm and CACAO algorithm are able to assign channels dynamically so the performance is fairer for all the clients.

A. Scheduling

To organize the preliminary nodes, access points and channels for the connection setup establishment process. We can find the delay and throughput for each channel by using the locations of the nodes and channel state information. Assign minimum delay and maximum throughput channels in the network.

B. Adaptive modulation and coding (AMC)

The adaptive modulation and coding is used to find the locations of the nodes from the Queue and store the Location information's in FIFO buffers. The realization of AMC offers several tests. First, AMC is responsive to extent error and holdup. In order to select the suitable inflection, the scheduler must be responsive of the channel excellence.

C. Channel state information (CSI)

The channel state information is the Number of APs Number of Nodes per each AP Number of Channels. The information describes how an indication propagates from the source to the receiver and represents the combined effect of, fading, and power decompose with a space.

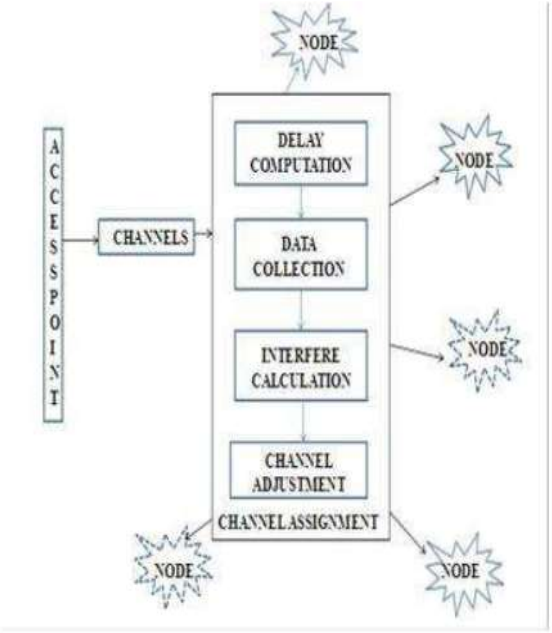


Fig2Channel Assignment Procedure

D. Calculation Using AMC and CSI

The adaptive modulation coding and channel state information is used to Find Delay and Find Throughput for the channel allocation. The result is used to find the best quality to assign the channel throughput to acquire the channel during allocating the nodes.

E. Allocation

Channel allocation is used to Assign Minimum Delay and Maximum throughput Channels base on the FIFO buffer information. All the nodes are assigned uniformly to the network while allocating the channel.

F. Gather Statistic

Collect the information about the source and destination node, current node, nearest node, available channel. Collect all the possible channel assignment details and updated in the table. To find the statistics for use channels free channels and traffic information's. Collect the information's about using channels, free channels and traffic information.

G. Interfere Calculation

Calculate the interference between the current node and the neighbouring node to assign the channel and the possible path. The path is chosen by the least interference between the channels based on the traffic information. It also calculates the interference about Number of channels .Interfere algorithm is also calculating the Total traffic analysed and Minimum traffic channel .The interfere method is also calculating the Number of Neighbours in the Access Point and Own traffic between the nodes.

H. Switch to best channel

Channel adjustment is to select the best channel If free channels available use the free channel. Else If own channel have Less than Minimum traffic channel and Minimum Interfere. Select the best channel and assign the path. Use own channel .Else Switch to Minimum traffic channel.

The above four methods are used to find the channel between the nodes based on the dynamic channel allocation scheme. This allocation is based on the traffic information, used channel availability, free channel vacancy and various interference between the nodes Assign the channel on the basis of minimum traffic. We have produced the result of minimum delay and maximum throughput for the channel.

Figure3 explained about the channel assignment procedure. Setting the nodes for assigning the channel Using modulation and channel information system finds the delay and throughput. Congregate the statistics from the traffic information. Compute the interference based on traffic, neighbours and nodes in the access point. Switch the channel to the minimum traffic and assign the channel. Avoiding Traffic and Interfere Method mainly proposed about minimum delay and maximum

I. Implementation

In this scheme all the channels are kept in a central pool. No base station has control on the channel. To increase both coverage and capacity for the frequency reuse process. The various parameters used in this ATIM are Channel type, radio-propagation model network interface type. The X axis map the number of access points and Y axis named as average throughput values in the dynamic channel allocation. Frequency allocation is modelled as a weighted colouring approach based on interference factor and weight functions. At CACAO method access point get the information from the client associated with them. The graphical result is done by fixing the node, give the connection, assign the protocol then connect the source and destination. Create the name file trace all the information stored in NF. Find the network efficiency and throughput calculation by the packet sent and data size. Assign the routing protocol plot the values in the table to the corresponding X and Y axis.

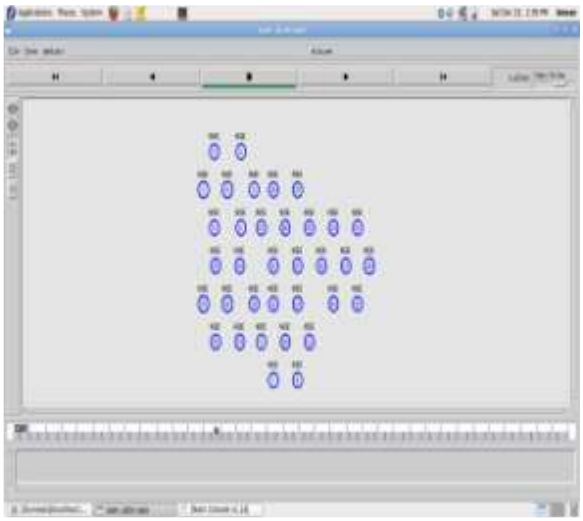


Fig 3. Create 34 nodes

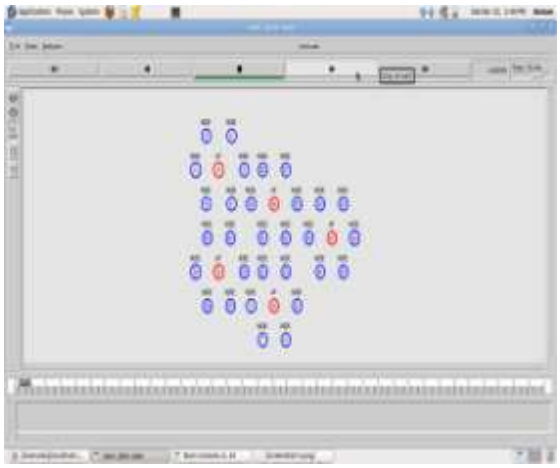
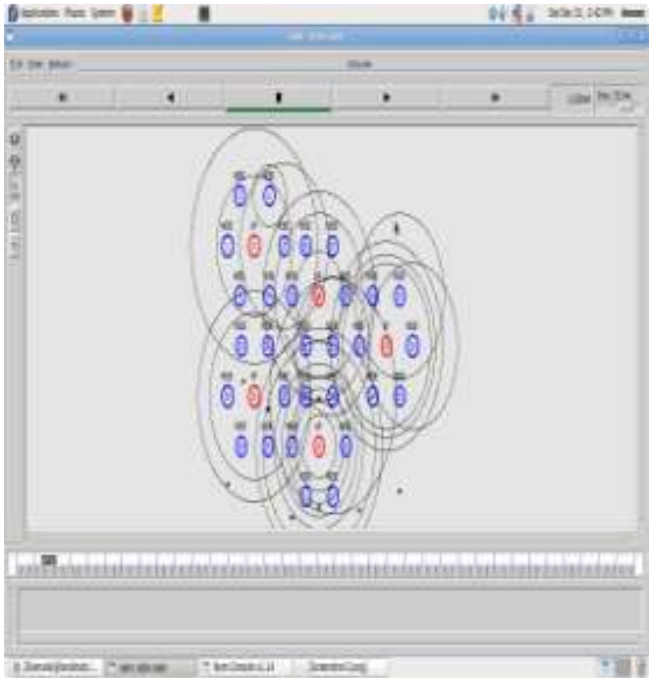
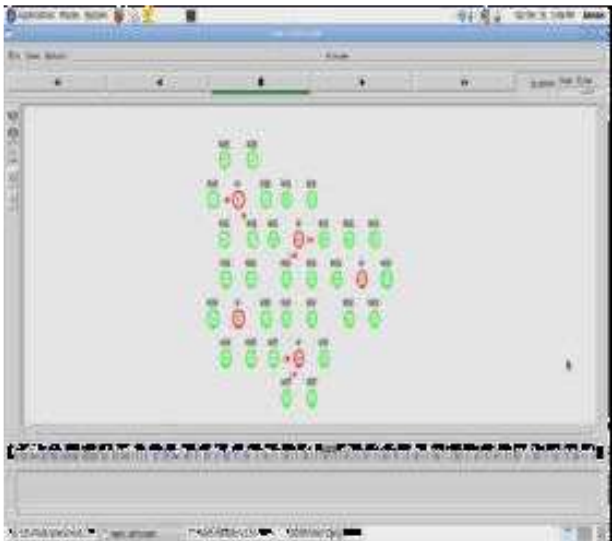


Fig4. Create access point

Fig5. Propagation signal





J. Results

In this section we consider the following network scenario, consisting of 20 access points and average throughput values of 280.Each channel that is primarily distributed equally between the nodes .The channels should be reused in the network to improve the quality of service Sometimes the channel is free we can use the same frequency band. We can calculate the proposed ATIM using channel allocation simulations with the NS-2 network simulator. We compare the performance of ATIM with CACAO channel allocation algorithm. The simulation result based on the number of access points used in the channel allocation. Allocate the channel to the base station and access point.

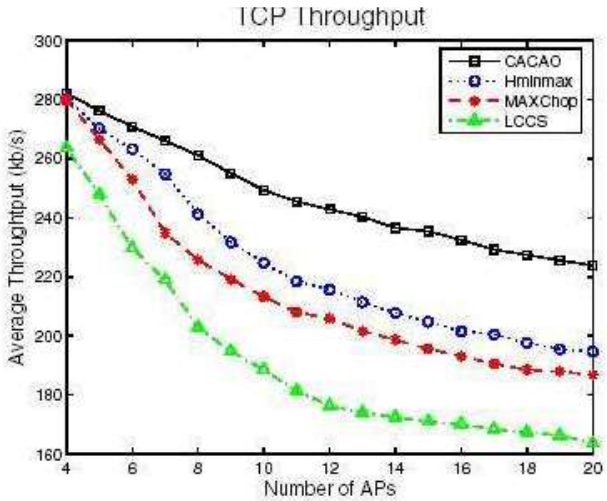


Fig8.Comparison result

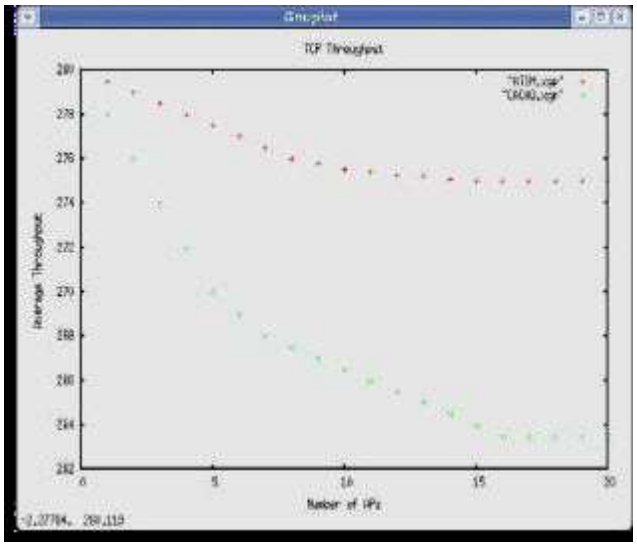


Fig 9. Result and Analysis

IV. CONCLUSION

The Interfere algorithm proposed a best possible solution for the packet delay and bandwidth allotment in the network by using this interfere method the quality of service is improved by channel assignment scheme called ATIM, to minimize the delay and give the maximum throughput for the dynamic channel allocation scheme. It also reduces the packet delay due to traffic load. It gives an optimal channel assignment solution in terms of minimum packet relaying delay and can also be used as a tool for performance comparison of differen network conditions and networking schemes. ATIM is a good approximation solution in terms delay and processing time. Simulation results also show that ATIM achieves (on average) 95 percent of the delay performance .It achieves high throughput and low delay as compared to the CACAO and is applicable to different cell sizes. Channel assignment is one of the components needed to allocate the channel in any form of traffic in wireless networks. The evaluation result demonstrates the best solution for the dynamic channel allocation for improving the quality of service.

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