Abstract— Characterizing the performance of unintended networks is one in every of the foremost complex open challenges; typical concepts supported information-theoretic techniques and inequalities haven't nevertheless been ready to with success tackle this drawback in its generality. Driven therefore, we tend to promote the completely uneven straightforward exclusion method (TASEP), a particle flow model in natural philosophy, as a helpful analytical tool to check unintended networks with random access. Using the TASEP framework, we tend to initial investigate the typical end-to-end delay and turnover performance of a linear multi-hop flow of packets. To boot, we tend to analytically derive the distribution of delays incurred by packets at every node, further because the joint distributions of the delays across adjacent hops on the flow. We tend to then think about additional advanced wireless network models comprising across flows, and propose the partial mean-field approximation (PMFA), a technique that helps tightly approximate the turnover performance of the system. We tend to finally demonstrate via a straightforward example that the PMFA procedure is sort of general therein it's going to be wont to accurately judge the performance of unintended network topologies.

Keywords-- Framework, partial mean-field approximation, flows.

I. INTRODUCTION

Overview of Load Balancing

Recent studies, on operational IEEE 802.11 wireless MANETs have shown that traffic load is usually inconsistently distributed among the access points (APs). In WLANs, by default, a user scans all out there channels Associate in Nursing associates itself with an AP that has the strongest received signal strength indicator (RSSI), whereas being oblivious to the load of APs. As users area unit, generally not equally distributed, some APs tend to suffer from serious load, whereas their adjacent APs could carry solely light-weight load. Such load imbalance among APs is undesirable because it hampers the network from absolutely utilizing its capability and providing truthful services to users.

A novel load reconciliation theme that reduces the load of full APs by forcing the users close to the boundaries of full cells to maneuver to neighboring less full cells. I attain this via cell size orientating by dominant the transmission pol of the AP beacon messages.

In my project, a Wi-Fi cell is outlined as a neighborhood during which the AP beacon signal has the strongest RSSI. My approach is conceptually almost like cell inhaling cellular networks, I gift Associate in Nursing optimum rule that finds settled min-max load reconciliation solutions. Informally, a Wi-Fi is named min-max load balanced, if it's not possible to scale back the load of any AP while not increasing the load of different APs with equal or higher load. My approach is sensible since it doesn't need either user help or commonplace modification. Load Balancing via User-AP Association Control Currently the IEEE 802.11 standard does not provide any standard method to resolve the load imbalance. To overcome this deficiency, various load balancing schemes have been pro- posed by both the academia and the industry. Most of these methods commonly take the approach of directly controlling the user-AP association by deploying proprietary client software or specially-designed WLAN cards at the user computers. For instance, some vendors have already incorporated certain load-balancing features in their device drivers, AP firm wares, and WLAN cards. In these proprietary solutions, the APs broadcast their load levels to users via modified beacon messages, and each user chooses the least-loaded AP.

Several studies have proposed a variety of association metrics instead of using the RSSI as the sole association criterion. These metrics typically take into account such factors as the number of users currently associated with an AP, the mean RSSI of users currently associated with an AP, and the bandwidth that a new user can get if it is associated with an AP. In [1] Proposed to associate a user with the AP that can provide a minimal bandwidth required by the user. If there exist many of such APs, the one with the strongest RSSI is selected.
They introduced a distributed load balancing architecture where the load of an AP is defined as the aggregated downlink and uplink traffic through the AP. In [2] proposed an association selection algorithm which is based on the concept of proportional fairness to balance between throughput and fairness. Most of this work heuristically determines only the association of newly arrived users is exceptions. They also proposed to re-associate users when the total load exceeds a certain threshold or the bandwidth allocated to users drops below a certain threshold. In an online scheme that periodically optimizes the user-AP association is proposed. This work also proved a strong correlation between fairness and load balancing, i.e., the fair service is obtained when the AP load is balanced.

Furthermore, since the maximal transmission power of the users is bounded, the users who are far from the base station may experience poor services. This so called near far problem may result in boundaries for reverse and forward links, as the latter is determined by the strength of the pilot signal of the base stations, independent of the interference.

In other words, the cell handoff boundary of the reverse link is tighter than that of the forward link. To overcome these problems the cell breathing approach was proposed by [4] independently. This approach shrinks the cell size of congested cells and balances the forward and reverse link handoff boundaries by reducing the pilot signal transmission power of the corresponding base stations. Therefore, in congested cells, users need to transmit with higher power to maintain a certain signal-to-interference ratio.

Although the user AP association control approach can achieve load balancing in WLANs, the requirement of deploying proprietary client software/hardware on all (or most) users raises an acute question about its practicality. Today, WLAN users frequently move between different WLANs, such as hotels, air ports, shopping centers and university campuses Different networks are managed by different organizations and likely adopt different load balancing mechanisms. It is unrealistic to require the users to have the appropriate client modules for each visiting network. This motivates the need for a new load-balancing scheme that does not require any proprietary client module at any modification of the standard.

**Cell Breathing for Load Balancing**

In CDMA cellular networks, the coverage and capacity of a cell are inversely related with each other. The increase of the number of active users in a cell causes the increase of the total interference sensed at the base station. Therefore, in congested cells, users need to transmit with higher power to maintain a certain signal-to-interference ratio at the receiving base station. As the users in a congested cell increase their transmission power, they also increase their interference to the neighboring cells since all cells use the same frequency band in CDMA networks. As a result, the overall network capacity may decrease.

Some studies have explored the benefit of combining the cell-breathing methods with other interference mitigation methods. For instance, [4] presented a solution for the near far problem, which is based on the combination of cell-breathing and bandwidth space partitioning. Generally speaking, the existing cell-breathing techniques utilize probabilistic local optimization methods. Therefore, they do not provide any guarantee on the quality of the solutions. Since the cells of WLANs are much smaller than those of cellular networks, the probabilistic local optimization methods may not work III in WLANs, as I will demonstrate later in the paper with a simple example. Moreover, these techniques cannot be easily applied to IEEE 802.11 WLANs, e.g., they require the change of scheduling algorithms or the knowledge on the user location. This motivates the design for a new cell-breathing method for WLANs which finds deterministic global optimal solutions. My algorithms are not tied to a particular load definition, but support a broad range of load definitions.
I treat the load of an AP as the aggregation of the load contributions of its associated users. The load contributions may be as simple as the number of users associated with an AP or can be more sophisticated to take account of factors like transmission bit rates and traffic demands. My scheme does not require any special assistance from users not any change in the standard.

**Min-Max Load Balancing Algorithm:**

In many places even free 802.11 accesses is offered. Recently, some cities e.g., Philadelphia and San-Francisco, declared their intention to build a free city-wide 802.11 networks. Since there are extensive literature on parallel machine scheduling problems and max-min solutions, I discuss here only the most relevant ones to my study. Most of the works on min-max (or max-min) solutions address the problem of finding a fair bandwidth allocation to a set of pre-determined routes in a wired network. Generally speaking, the existing cell-breathing techniques utilize probabilistic local optimization methods. Therefore, they do not provide any guarantee on the quality of the solutions. Since the cells of WLANs are much smaller than those of cellular networks, the probabilistic local optimization methods may not work III in WLANs, as I will demonstrate later in the paper with a simple example. More over, these techniques cannot be easily applied to IEEE 802.11.

In other words, the cell handoff boundary of the reverse link is tighter than that of the forward link. To overcome these problems the cell breathing approach was proposed by [6] independently. This approach shrinks the cell size of congested cells and balances the forward and reverse link handoff boundaries by reducing the pilot signal transmission power of the corresponding base stations.

My algorithms are not tied to a particular load definition, but support a broad range of load definitions. I treat the load of an AP as the aggregation of the load contributions of its associated users. The load contributions may be as simple as the number of users associated with an AP or can be more sophisticated to take account of factors like transmission bit rates and traffic demands. In [3] pro-posed a distributed load balancing technique that utilizes a bobble oscillation algorithm.

In [4] proposed a method that coordinates the packet level scheduling with cell-breathing techniques. In particular, their approach can be applied to load conserving instances of the unrelated parallel machine scheduling problem, where each job imposes the same load on the sub set of machines on which it can be run. In [5] proposed a method that coordinates the packet level scheduling with cell-breathing techniques. Generally speaking, the existing cell-breathing techniques utilize probabilistic local optimization methods. Therefore, they do not provide any guarantee on the quality of the solutions.

Since the cells of WLANs are much smaller than those of cellular networks, the probabilistic local optimization methods may not work III in WLANs, as I will demonstrate later in the paper with a simple example. Moreover, these techniques cannot be easily applied to IEEE 802.11. My algorithms are not tied to a particular load definition, but support a broad range of load definitions. I treat the load of an AP as the aggregation of the load contributions of its associated users. The load contributions may be as simple as the number of users associated with an AP or can be more sophisticated to take account of factors like transmission bit rates and traffic demands. My scheme does not require any special assistance from users not any change in the standard.

Illustrates This Classic Load Balancer Architecture.

Shows An L vs. Implementation That Uses Nat Routing.
Selecting routes for the max-min fair bandwidth allocation is a much harder problem and has been studied. In [6] addressed the single-sMyce fractional flow problem and presented a polynomial time algorithm that finds an optimal max-min fair solution. Extending this work, Kleinberg et al. considered the case that a connection is routed along a single path. In particular, their approach can be applied to load conserving instances of the unrelated parallel machine scheduling problem, where each job imposes the same load on the sub-set of machines on which it can be run.

They argued that a coordinate wise constant-factor approximation cannot be found for this problem and presented a prefix sum 2-approximation algorithm, in which for every integer the sum of the first coordinates of the calculated machine load vector sorted in increasing order is at most twice the sum of the first coordinates of the optimal min-max fractional assignment. In spite of this, I identified a variant of this min-max problem, termed min-max priority load balancing, whose optimal solution can be calculated in polynomial-time for both knowledge models. Here, the AP load is defined as an ordered pair of the aggregated load contributions of its associated users and a unique AP priority.

The first model assumes complete knowledge, in which the user-AP association and the corresponding AP load are known a priori for all possible beacon polr assignments. Since such information is not readily available in current WLANs, I also consider the second model, the limited knowledge model, in which only information on the user-AP association and AP load for the current beacon polr assignment is available. The algorithms for the complete knowledge model serve as building blocks for the algorithms for the more practical limited knowledge model. I present my algorithms in two steps. At first, I address the problem of minimizing the load of the most congested APs, whose load is called the congestion load.

I present two polynomial time algorithms that find optimal solutions, one for the complete knowledge model, and another for the limited knowledge model. These results are intriguing, because similar load balancing problems are known to be strong hard. It is particularly interesting that a polynomial time optimal algorithm exists for the limited knowledge model. My algorithms are rooted from a simple observation that as long as the current polr setting ‘dominates’ the optimal setting (i.e., each AP has the same or higher polr level than its polr level in the optimal solution), an optimal solution can be obtained by a certain sequence of polr reduction operations.

My algorithms will be run on a network operation center which collects the load and association information from the APs via such methods as SNMP. Depending on the extent of the available information, I consider two knowledge models.
Through extensive simulations, I show that the performance of my cell-breathing methods is overall comparable with or superior to the existing association control methods, irrespective of network load patterns. In particular, I could achieve such performance even with a small number of power levels. My min-max priority load balancing algorithms yield near optimal results even for the non-priority min-max problem by randomly choosing AP priorities.

II. REVIEW STAGE

Several studies have proposed a variety of association metrics instead of using the RSSI as the sole criterion. These metrics typically take into account such factors as the number of users currently associated with an AP, the mean RSSI of users currently associated with an AP, and the bandwidth that a new user can get if it is associated with an AP. e.g., [1] proposed to associate a user with an AP that can provide a minimal bandwidth required by the user. They introduced a distributed Load balancing architecture where the AP load is defined as the aggregated downlink and uplink traffic through the AP. In [2] proposed association selection algorithms which are based on the concept of proportional fairness to balance between throughput and fairness. In [3] provided a mathematical foundation for distributed frequency allocation and user association for efficient resource sharing.

Recently, in [5] considered a no cooperative multi-homing approach and show that under appropriate pricing, the system throughput is maximized. In a strong relation between fairness, Functions such as email exchange, access and database access are built on the client/server model. Users accessing banking services from their computer use a browser client to send a request to a server at a bank.

That program may in turn forward the request to its own database client program, which sends a request to a database server at another bank computer to retrieve the account information. The balance is returned to the bank database client, which in turn serves it back to the browser client, displaying the results to the user. The client–server model has become one of the central ideas of network computing. Many business applications being written today use the client–server model, as do the Internet’s main application protocols, such as HTTP, SMTP, Telnet and DNS. In computing, a server is any combination of hardware or software designed to provide services to clients.

Enforcing QoS In MANETs Nodes

I reduce the load of congested APs by reducing the size of the corresponding cells. Such cell dimensioning can be obtained, for instance, by reducing the transmission power of the congested APs. This forces users near the congested cells’ boundaries to shift to adjacent (less congested) APs.

The separation between transmission power of the data traffic and the AP beacon messages. On one hand, the transmission bit rate between a user and its associated AP is determined by the quality of the data traffic channel. Transmitting the data traffic with maximal power maximizes the AP-user SNR and the bit rate. On the other hand, each user determines its association by performing a scanning operation, in which it evaluates the quality of the beacon messages of the APs in its vicinity.

III. CONCLUSION

I presented a novel scheme for optimal load balancing in IEEE 802.11 WLANs. I provided rigorous analysis of the problem and presented two algorithms that find deterministic optimal solutions. The first algorithm minimizes the load of the congested AP(s) in the network, and the second algorithm produces an optimal min-max (priority) load balanced solution.

In the proposed system I have design five modules. They are Access Point Emulation Cell Breathing Using Beacon Signal packets, dynamic Power Assignment, Enforcing QOS In MANET Nodes Throughput and Load Optimization Using Priority Algorithm.
I have implemented first three modules such as Access Point Emulation, Cell Breathing Using Beacon Signal packets and Dynamic Power Assignment which consist access point and server registration, Beacon signal transmission and power shrinking techniques. These optimal solutions are obtained only with the minimal information which is readily available without any special assistance from the users or modification of the standard remaining two modules such as Enforcing QOS in MANET Nodes, Throughput and Load Optimization Using Priority Algorithm will be implementing. In which I provide quality of services and priority to registered clients.

REFERENCES