MOBILITY PREDICTION BASED ADAPTIVE, ROUTING AND SCHEDULING

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ABSTRACT--- The mobility prediction algorithm link failure will be high in wireless network. So the algorithm may not work properly in high mobility wireless network. So, Mobility prediction algorithm can be implemented as future work and can overcome the drawbacks. In wireless Networks if forwarding nodes have high mobility, may chances to make local topology inaccuracy. If the node involved in the forwarding path node moves frequently then there is the situation of frequent beacon update is required which leads to network traffic in turn packet collision. Hence it is required to select the nodes with low mobility which means selection of stable node as forwarder based on its mobility. This system with low mobility based forwarding node selection that improves routing performance.

IndexTerms- **Mobility-prediction,algorithm network coding,routing,scheduling.**

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1.INTRODUCTION

Mobility prediction is circuit switching telecommunication network was originally designed to handle voice traffic on these networks continues to be voice. A key characteristic of circuit switching networks is that resources within the network are dedicated to a particular call. For voice connections, the resulting circuit will enjoy a high percentage of utilization because, most of the time one party or the other is talking. However, as circuit switching networks began to be used increasingly for data connections, two shortcomings became apparent: the adaptive routing algorithm is rarely used. The main reason for this is that the routing algorithm can lead to poor delay performance due to routing loops each node to maintain per-destination queues that can be burdensome for a wireline or wireless router. The mobility prediction routing algorithm in this paper and design a new algorithm that has much superior performance and low implementation complexity. In addition to provably throughput-optimal routing that minimizes the number of hops taken by packets in the network. Line efficiency is greater, because a single node to node link can be dynamically shared by many packet over time. The packets are queued up and transmitted as rapidly as possible over the link. By contract, with circuit switching time on a node to node link is pre allocated using synchronous time division multiplexing, Much of the time, such a link may be idle because a portion of its time is dedicated to a connection that is idle. The algorithm can be applied to wireline and wireless networks. Extensive simulations show dramatic improvement in delay performance compared to the mobility prediction algorithm. In the authors propose and study rate control algorithms that adapt the flow rates instantaneously as a function of the entry queue-lengths. The rate control mechanism studied in all of these works can be categorized as the since it can be interpreted as a gradient algorithm for the dual of an optimization problem. The intrinsic assumption of

the dual congestion control mechanism is that the flow rates can be changed instantaneously in response to congestion feedback in the network. However, it is well known that adaptive window flow control mechanisms such as respond to congestion feedback not instantaneously, but gradually. Such a response is desired by practitioners because the rate fluctuations are small. Thus, the study of another algorithm that modifies the flow rates gradually is important. To this end, we propose and study the so called C in this work algorithms are well known in the optimization literature and have been studied extensively in different contexts. Since the response of the is more gradual compared to the dual controller, it is not immediately clear as to whether the buffer stability a nd rate convergence properties will be maintain We note that the algorithm considered in updates its rates Such approaches are often called mobility prediction based, as routing.

2.SYSTEM DESIGN

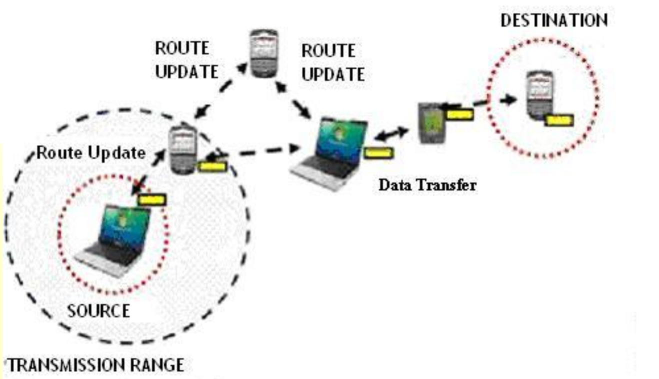


Fig a: System diagram

2.1 Architecture Model

Wireless sensor networks Using the concept of shadow queues, we partially decouple routing and scheduling. A shadow network is used to update a probabilistic routing table that packets use upon arrival at a node. The same shadow network, with back-pressure algorithm, is used to activate transmissions between nodes. However, first, actual transmissions send packets from first-in–first-out (FIFO) per-link queues, and second, potentially more links are activated, in addition to those activated by the shadow algorithm. The routing algorithm is designed to minimize the average number of hops used by packets in the network. This idea, along with the scheduling/routing decoupling, leads to delay reduction compared with the traditional back-pressure algorithm. Each node has to maintain counters, called shadow queues, per destination. This is very similar to the idea of maintaining a routing table per destination. However, the real queues at each node are per-next-hop queues in the case of networks that do not employ network coding. When network coding is employed, per-previous-hop queues may also be necessary, but this is a requirement imposed by network coding, not by our algorithm. Thus the main concept is here to develop a unified routing algorithm called the Energy-efficient Unified Routing (EUR) algorithm that accommodates any combination of these above key elements and adapts to varying wireless environments. This study shows the impact of key wireless elements on routing, through simulations. queuing architecture and a dynamic routing-scheduling-coding strategy for serving multiple queue when linear network transmission is allowed across multiple queue. This policy provides a novel extension to the class of back-pressure policies by incorporating inter-session scheduling and routing decisions through simple rules on the relevant queue-length levels. This strategy decides whether the independent flows can be combined together serve multiple queues.

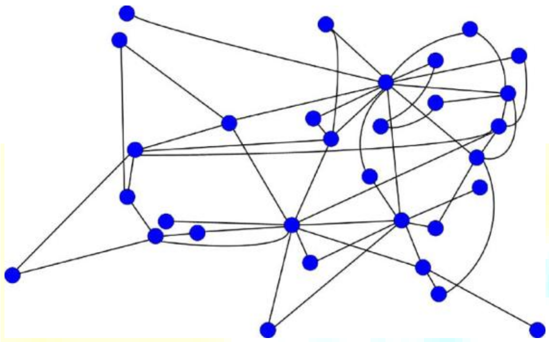
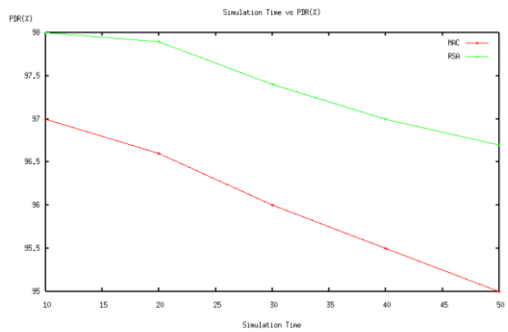


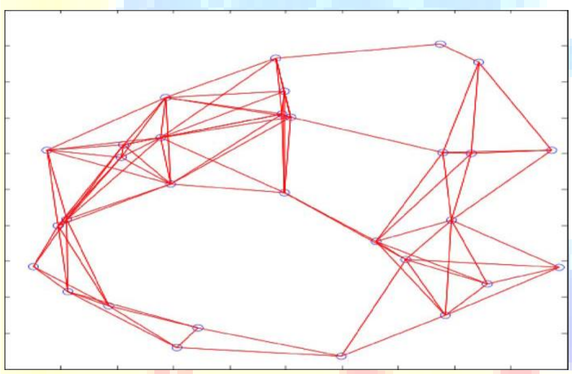
Fig b:network topology

2.2 SIMULATIONS:

We establish, for multiple multicast sessions with intra-session network coding, the capacity region of input rates for which the network remains stable in erotically time-varying networks. Building on the back-pressure approach introduced by Tassels et al., we present dynamic algorithms for multicast routing, network coding, rate control, power allocation, and scheduling that achieves stability for rates within the capacity region. Decisions on routing, network coding, and schedule- in between different sessions at a node are made locally at each node based on virtual queues for deferent sinks. For correlated sources, the sinks locally determine and control transmission rates across the sources. The proposed approach yields a completely distributed algorithm for wired networks. In the wireless case, scheduling and power control among deferent transmitters sources and sinks such that data from all the sources is intended for all the sinks. We establish, for multiple multicast sessions with intra-session network coding, the capacity region of input rates that can be stabilized. We present dynamic algorithms for routing, network coding, scheduling and rate control across correlated sources that achieve stability for rates within the capacity region. In this, we compare both the theoretical and simulation results under our protocol with those under the protocol. The comparison between the time and the end to end delay is evaluated. Then how the bandwidth overhead is reduced compared to the existing system is also studied. Then increase of the throughput and the packet delivery ratio, packet loss is also evaluated.

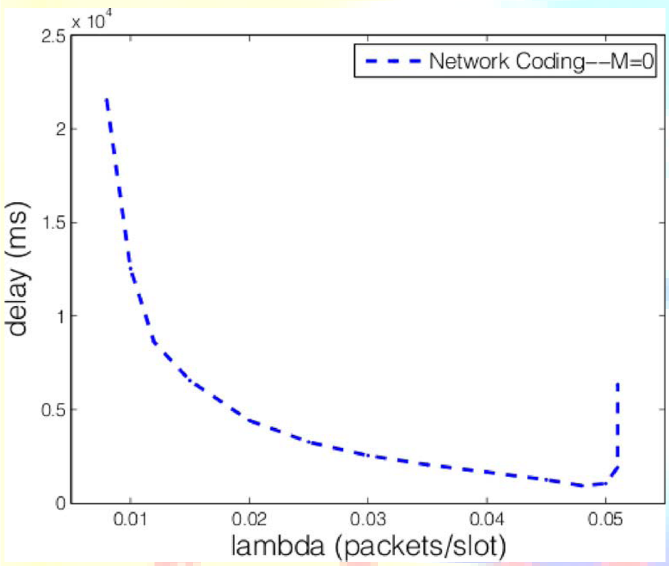


nodes with communication links between them that are xed or time-varying according to some specied ergodic processes and transmission of a set of multicast sessions *C* through the network. Each session *c 2 C* is associated with a set *Sc ½ N* of sources, and an exogenous process of data arrivals at each of these sources which must be transmitted over the network each of a set *Tc ½ N* of sinks. Transmissions are assumed to occur in slotted time, with time slots of length *T*.



Figc :Wireless network topology with 15 nodes

First, there are n number of sensor nodes are randomly deployed. In order to transmit data between sender and receiver it uses AODV routing algorithms. It is used for the data transmission during routing the data congestion occur at particular node in the network. Due to congestion that particular node gets partitioned into another two nodes. During the partitioning one node become dead and another node become alive. Since the node become dead it cannot do further transmission. The condition of the theorem means that if a subset L does not satisfy local pooling, then the rank of the service vectors is too small for the scheduler to be able to keep the queue lengths from diverging. In applications, it may be useful to infer stability for some given feasible _ rather than for all feasible rates, as in Theorem 1. In these cases, Theorem 1 implies stability under the same conditions on the arrival processes, when queues L that do not satisfy local pooling (having necessarily instead: The optimum c of the linear program. For the wired network case the network connectivity and the link rates are xed.For the wireless case, these depend on the transmission powers. We model wireless transmissions by generalized links, denoted by (*a;Z*), where *a* is the originating node and *Z* is the set of receiving nodes. Each generalized link can correspond to We allow broadcast transmission in our network model. In order to define a schedule, we first define two kinds of "links": the point-to-point link and the broadcast link. A point-to-point link is a link that supports point-to-point transmission,



Figd:Packet delay as a function of under PARN for in the wireless network

under 2-hop interference model with network coding. a single transmission from node *a* to neighboring destination nodes at which the SINR of the transmission is greater than some threshold, or a multi-step transmission in which transmits to one or more destination nodes, some of which, possibly together with *a*, repeat the transmission in the next time slot, and so on. Combining receptions from multiple transmissions of the same information has been investigated for broadcast in [1, 13]. Partial receptions are combined at destination nodes; the transmission rates in a transmission scenario containing such links are averaged over the number of time slots over which such forwarding takes place. Link rates $^1(P; S) = (^1aZ(P; S))$ are determined by the vector of transmit powers $P(t) = (PaZ(t))$ and a channel state vector $S(t)$. $S(t)$ is assumed to be constant a transmission problem with correlated sources is considered *achievable* with intra-session network coding if there exists a sequence of codes such that the probability of decoding any session c source symbol in error at any sink in Tc tends to zero. Decoding can be done by a variety of methods such as typical set decoding or minimum entropy decoding. the performance of the probabilistic splitting algorithm versus the token bucket algorithm. In our simulations the token bucket algorithm runs significantly faster, by a factor of 2. The reason is that many more calculations are needed for the probabilistic splitting algorithm as compared to the token bucket algorithm. This may have some implications for practice. Thus, in Fig. 12, we compare the delay performance of the two algorithms. As can be seen from the figure, the token bucket and probabilistic splitting algorithms result in similar performance. Therefore, in practice, the token bucket algorithm may be preferable.

2.3Adaptive Routing Algorithms

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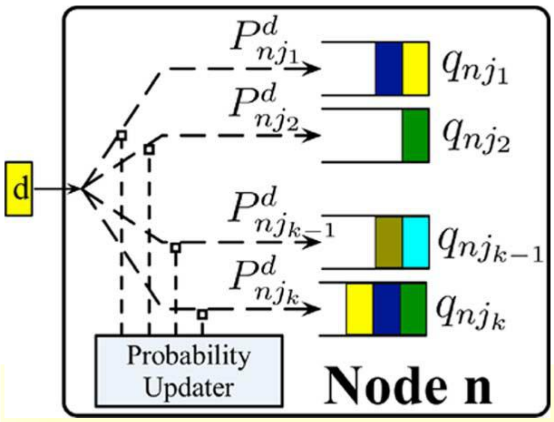
The back-pressure policy for correlated sources differs from that for independent sources primarily in the operation at the sinks and the sources. The rates at which packets are injected into the network by the different sources of a session may have traded against each other if the total information rate from all the sources exceeds the joint entropy rate. We propose a mechanism in which the different sinks monitor the amount of information received from each of the sources and provide feedback implicitly through back-pressure to throttle the source rates. This is accomplished by maintaining virtual queues on a per source basis at each of the sinks and emptying these queues at appropriate rates. The information in these virtual queues creates the necessary gradient in queue sizes that then propagates back to the sources. The sources compress the information stream and transmit packets into the network at rates limited by the gradients and thus each source in the set of correlated sources transmits at the appropriate rate.

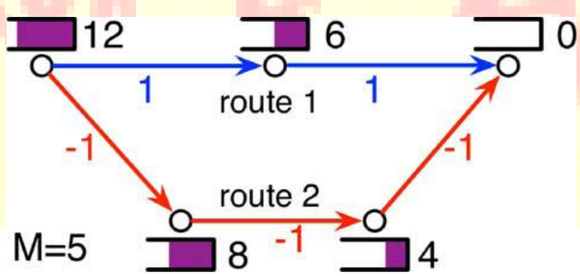


Fige:Probabilistic splitting algorithm at node:

At each time-slot, the following sequence of operations occurs at each node . A packet arriving at node for destination
is inserted in the real queue for next-hop with probability.

2.4 Min-Resource Routing by Back-Pressure

M-back-pressure algorithm could reduce the delay by forcing flows to go through shorter routes, simulations indicate a significant problem with the basic algorithm presented above. A link can be scheduled only if the back-pressure of at least one destination is greater than or equal to . Thus, at light to moderate traffic loads, the delays could be high since the back-pressure may not build up sufficiently fast. In order to



Figf: Routing dig

Each node maintains a separate queue of packets for each destination ; its length is denoted .Qnt[dt Each link is assigned a weight.

$$w_{nj}[t] = \max_{d}\left(\frac{1}{M}Q_{nd}[t] - \frac{1}{M}Q_{jd}[t] - 1\right)$$

Where M>0 is a parameter

Scheduling/routing rule:

$$\pi^*[t] \in \arg\max_{\pi\in\Gamma} \sum_{(nj)\in\pi} c_{nj} w_{nj}[t].$$

we remove packets from if possible and transmit those packets to , where achieves the maximum . Note that the above algorithm does not change if we replace the weights in by the following, rescaled ones: which shows that the average rate obtained by each user can be made arbitrarily close to its fair share (as defined by the resource allocation problem (4)) by letting K become large and choosing 1/K2. If = 1/K2, from the proof of Proposition (K) = O(K2) and the sum of the queue lengths in the network (also known as backlog) is upper-bounded by O(K). Thus, assuming that the upper bound is a reasonable estimate of the backlog, there exists a tradeoff between backlog and fairness, which can be controlled through the choice of K. If K is large, the asymptotic rate allocation is close to the fair allocation but at the cost of larger backlog. Queues that have one of their neighbors already selected are not considered in the next iteration step. When two or more queues under consideration have equal backlog, a tie-breaking rule must be specified. This procedure is stopped until no further (nonempty) queue can be included.

• The routing algorithm is designed to minimize the average number of hops used by packets in the network. This idea, along with the scheduling/routing decoupling, leads to delay reduction compared with the traditional back-pressure algorithm.

• Each node has to maintain counters, called shadow queues, per destination. This is very similar to the idea of maintaining a routing table per destination. However, the real queues at each node are per-next-hop queues in the case of networks that do not employ network coding. When network coding is employed, per-previous-hop queues may also be necessary, but this is a requirement imposed by network coding, not by our algorithm.

• The algorithm can be applied to wireline and wireless networks. Extensive simulations show dramatic improvement in delay performance compared to the back-pressure algorithm. The rest of this paper is organized as follows. We present the network model in Section II. In Sections III and IV, the traditional back-pressure algorithm and its modified version are introduced. We develop our adaptive routing and scheduling algorithm for wireline and wireless networks with and without network coding in Sections.

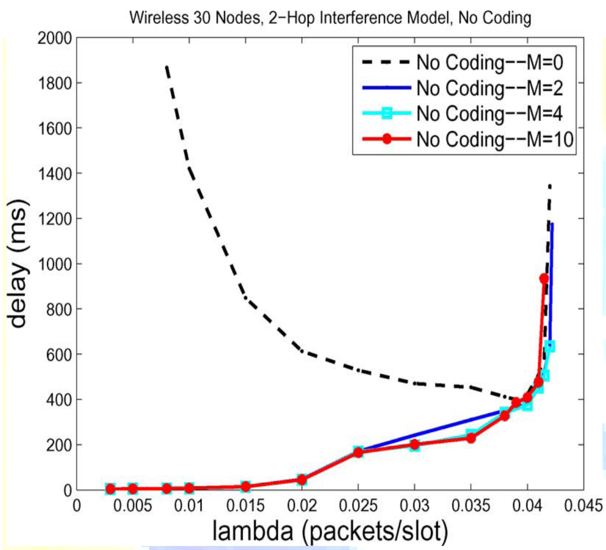


Fig g:Packet delay

3. METHODOLOGY

3.1 An Environment Creation

SafeQ is a protocol that prevents attackers from gaining information from both sensor collected data and sink issued queries. SafeQ also allows a sink to detect compromised storage nodes when they misbehave. To preserve *privacy*, SafeQ uses a novel technique to encode both data and queries such that a storage node can correctly process encoded queries over encoded data without knowing their values.

3.2 Storage Node

Storage nodes are powerful wireless devices that are equipped with much more storage capacity and computing power than sensors.The storage node collects all data from the sensor nodes. The storage node can't view the actual value of sensor node data. If the storage node trying to view the sensor node data, sink detect misbehave of storage node.

3.3 Sink

The sink is the point of contact for users of the sensor network. Each time the sink receives a question from a user, it first translates the question into multiple queries and then disseminates the queries to the corresponding storage nodes, which process the queries based on their data and return the query results to the sink. The sink unifies the query results from multiple storage nodes into the final answer and sends it back to the user. Sink can detect compromised storage nodes when they misbehave.

3.4 Range Queries

The queries from the sink are range queries. A range query finding all the data items collected at time-slot in the range" is denoted as. Note that the queries in most sensor network applications can be easily modeled as range queries. a relay between two other nodes XORs packets and broadcasts them to decrease the number of transmissions. There is a tradeoff between choosing long routes to possibly increase network coding opportunities and choosing short routes to reduce resource usage.

4. CONCLUSION

The Mobility prediction algorithm which maintains a deterministic route to avoid dead node during the partitioning of node in the network. It also has probability updater which updates the route on each transmission. This algorithm mainly helps in routing the packet on shortest hops. Hence the delay in routing the packet is reduced and performance is improved. Next, adaptive routing algorithm implements the shadow queue technique. It helps in routing the packet according to their priority so that congestion or buffer overflow may be prevented. It also reduces the queuing complexity at each node. Finally the throughput is increased and energy efficiency is achieved in Wireless networks. The experimental evaluation on a Linux-based implementation and NS2-based simulation has demonstrated the effectiveness of backpressure algorithm and adaptive routing in recovering from local link-failures and satisfying applications diverse QoS demands by achieving the energy efficiency. Several future research directions can be investigated. The performance can be enhanced in future by improving the routing algorithm to be more energy efficient.

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