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DISTRIBUTION AND REUSABILITY UNIFIED ROUTING IN MULTI-HOP WIRELESS NETWORKS USING MAC LAYER

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ABSTRACT:

We investigate the combination of distributed geographic routing with transmission power control for energy efficient delivery of information in multi hop wireless networks. Using realistic models for wireless channel fading as well as radio modulation and encoding. a special signal-to-noise ratio (SNR) constant is computed using an elegant characteristic equation. Counter-intuitively for typical radios this corresponds to an optimal operating point of SNR that lies in the transitional region. We propose local power efficiency metric for distributed routing such that at each step the transmitter picks as the next hop the neighbor for which this metric is maximized. These packets will eventually be dropped at the MAC layer, reducing channel utilization. Our contribution is here to develop a unified routing algorithm called the Energy-efficient Unified Routing (EURo) algorithm that accommodates any combination of these above key elements and adapts to varying wireless environments. We propose DCAR the Distributed Coding-Aware Routing mechanism is enables the discovery for available paths between a given source and destination, and the detection for potential network coding opportunities over much wider network region. A novel routing metric called Coding aware Routing Metric (CRM) which facilitates performance comparison between "coding-possible" and "coding-impossible" paths. We carefully choose the spatially reusable links in the routing path and sometimes optimal the overhead that we incur is because of the reduction in the complexity of finding spatially reusable links in the routing path.

Index Terms: Spatial Reuse, Multi-Hop Routing, Conservative Approach, network coding, wireless networks, routing. energy conservation, cross-layer, simulations

.1. INTRODUCTION

Geographic routing protocols is essential importance to sensor networks because they can exploit available localization information to provide low-overhead and highly scalable routing and querying. Several recent studies have stressed the importance of looking at realistic link conditions and incorporating them explicitly into the design of wireless ad hoc and sensor network routing protocols [1]. We call this the problem of MAC-layer capture because the MAC layer remains captured in receiving unproductive packets [2]. When using unidirectional antennas, there is little incentive to select which packets should is received. It cannot initiate a concurrent communication while that packet transmission is in progress [3]. In the case of multi-hop wireless networks efficient routing algorithms is critical for network performance [4]. The energy efficiency of multichip wireless networks is also receiving increasing attention due to its increasing importance of sensor networks in smart grids [5]. In previous works main metrics is used for energy efficient routing: transmission power, interference, residual battery energy, and energy replenishment [6]. Network coding was originally proposed for wired networks and the throughput gain was illustrated by the well-known example of "butterfly" network [7]. Recently, there is a

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growing interest to apply network coding onto wireless networks since the broadcast nature of wireless channel makes network coding particularly advantageous in terms of bandwidth efficiency and enables opportunistic encoding and decoding [8]. QoS is the network capacity, transmission rate, error rate, accuracy, delay, throughput and other Quality of Service metrics can be measured and improved in a network by incorporating certain algorithms [9]. It is the ability to guarantee to a certain level of performance in a network. Spatial Re usability in Wireless Networks has become a key point to improve network capacity [10].

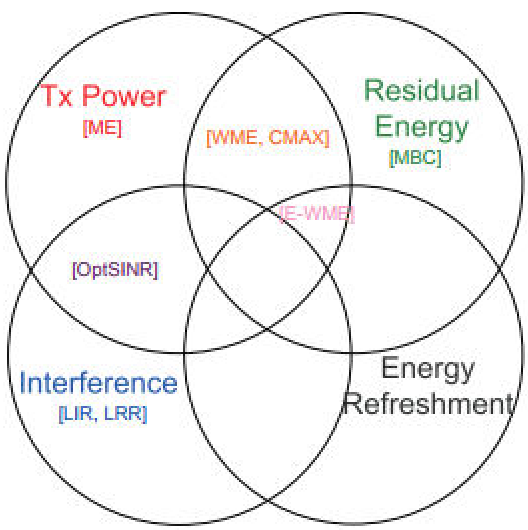

Fig. 1. Previous works for energy-efficient routing

2. RELATED WORK

Geographic routing protocols is essential importance to wireless sensor networks. They make use of available localization information, and can provide a significant reduction of complexity and overhead [11]. While there has been prior research on preventing dead ends in geographic routing through face-routing techniques [12]. We assume the density is sufficiently high that greedy geographic forwarding is sufficient to ensure end-to-end delivery [13]. Early work on directional MAC protocols improved spatial reuse by enabling nearby communications to progress in parallel [14]. Further investigation introduced the notion of directional virtual carrier sensing through the directional NAV (DNAV) mechanism several tradeoffs were also identified including new hidden terminal problems that limit the benefits of beam forming [15]. Subsequent protocols addressed some of these problems and raised the limits on achievable performance further improvements can still be obtained by avoiding MAC-layer capture and receiving only those packets that are productive [16]. The proposed algorithm is require any scheduling and has less overhead there exist works aimed at exploiting spatial reusability [17]. Specifically details the effect of carrier sense range for spatial reuse in wireless networks. The latest work and the only work that deal with spatial reuse routing is the computational overhead in this work is so high on destination nodes that makes it impractical for energy constrained wireless networks which is the case in sensor networks [18].

3. SYSTEM MODEL

We present the implementation details of DCAR in ns2. We modified the DSR routing agent in ns-2 to include the “coding+routing” find path selection functions [19]. We also change the Interface Queue to include encoding and decoding functions. The DCAR routing agent maintains a list of one-hop neighboring nodes and the corresponding link qualities periodically broad casting [20]. We also add the encoding and decoding functions into the interface queue the encoded packets we use similar packet format as in COPE [21]. Whenever we receive a packet we first check whether it is a native or encoded packet using the “Classifier”, and then forward it up to upper layers or decode it accordingly [22].

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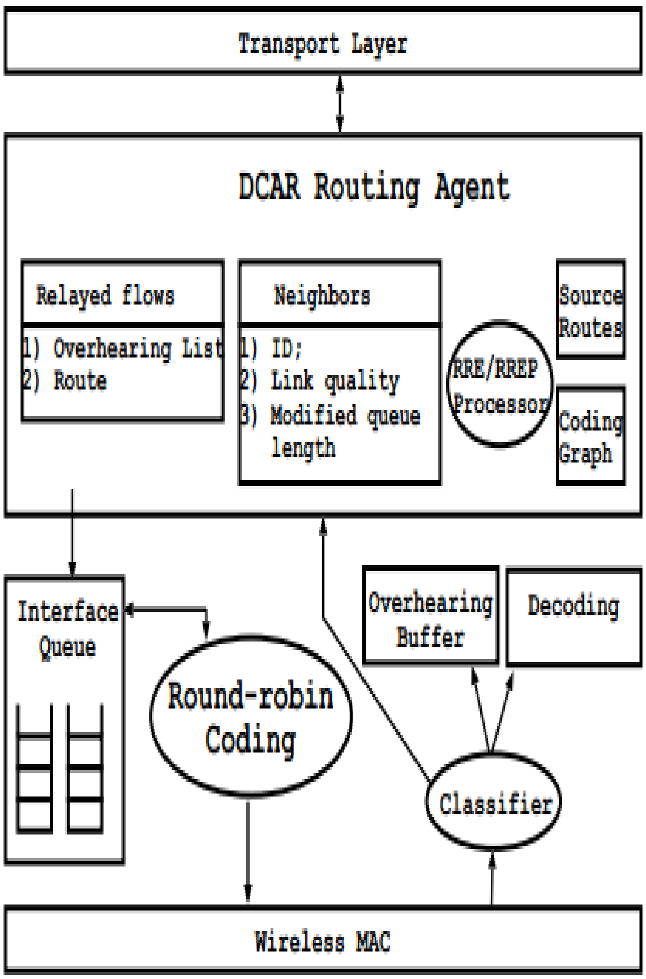

Fig. 2. DCAR Architecture

4. PROPERTIES OF THE UNIFIED ROUTING ALGORITHM

We study the properties of the unified routing algorithm proposed the metric used in our routing algorithm is composed of the product of three components that represent energy, transmission power, and the impact of the transmission power [23]. We categorize measurement elements regarding battery energy as a single class and study the impact of battery energy. In many wireless environments as summarized every component plays a role our routing algorithm [24].

A. Optimal-Dynamic and Optimal-Static Routes

We compare the globally optimal routing mechanisms. First note that if channel conditions in a wireless network change rapidly, it is impossible to find an optimal route between any source-sink pair even with global knowledge of link state information. It is because the best route found at the beginning of a transmission is potentially no longer the best one when the packet is along the way to the receiver. Therefore in order to well-defined notions of global-optimal route and channel conditions remain fixed for the time duration of the end-to-end transmission of one packet [25].

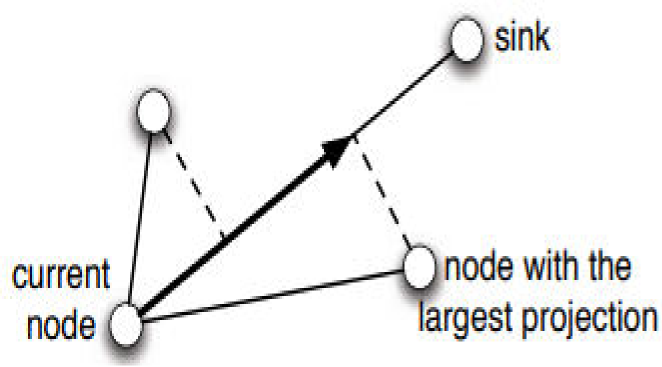

Fig. 3. Projection the hop distance sink node

B. Antenna Model:

We assume the radiation pattern of the antenna is multiple beams the number of beams is controlled through signal processing or multi mode switching. The maximum number of beams is given time is limited by the number of elements in the antenna array [26]. At any given time, the antenna can either transmit or receive a single packet. An abstract block diagram of a multiband switched antenna is subsets of the beams is turned on/off using the switches, creating beam patterns like the ones of course, this is an overly simplistic representation, used for the convenience of explanation. Antenna patterns used in our simulation are taken from realistic antennas with side lobes.

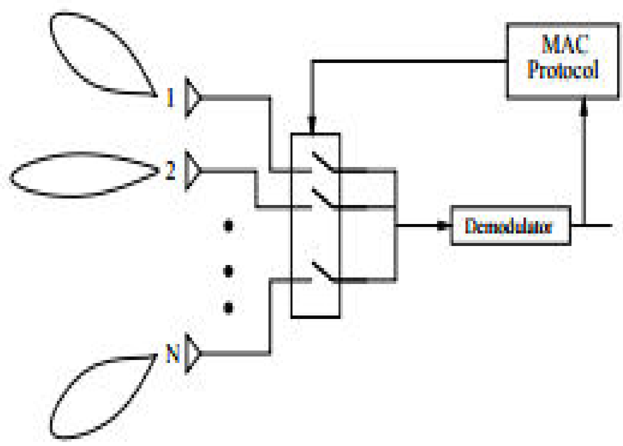

Fig. 4. Switched combining with multi-beam antennas

C. Distributed Coding + Routing Algorithm

Let us now describe to discover the available path for a new flow initiated into the wireless network, and at the same time, find the potential coding opportunities of the paths. We find the path with coding opportunity to impose the requirement that the new flow has to take this path as its routing outcome; instead, we have another module which will evaluate the benefit of each path and to make the final path [27].

Step1. The source node s initiates the route discovery by broadcasting the Route Request (RREQ) message.

Step 2. Upon receiving a RREQ, an middle node, say node c, first checks whether the RREQ has already traversed through itself.

Step 3. When a RREQ reaches the destination node the destination replies with the Route Reply (RREP) message using the reverse path back to the source node The RREP is a uncast message that contains the "path" information.

Step4. Upon receiving a RREP, an intermediate node, say node compares the upstream path contained in the RREP with the paths in its temporally stored RREQs. If there is a match then it has obtained both the "path" and "who-can overhear" information for the new path. Each node also maintains the "path" and "who-can-overhear"

Step 5. When the RREP(s) return to the source node, a routing decision is made based on the potential coding opportunities and the benefit of each available paths and the source node begins to send data packets on the selected path.

Step 6. When the first data packet reaches an intermediate node, say node it stores the "who-can-overhear" and "path" information for the selected path, while discarding other temporally stored information.

5. PERFORMANCE EVALUATION

We use the Quaint simulator, version 3.6, for simulating our proposed protocols. We consider many scenarios, and systematically analyzed the factors that impact protocol performance. We use a transmission data rate of 11 Mbps. We use a two-ray ground reflection model with Rayleigh fading. We use constant bit rate (CBR) traffic at each source node. The simulated antenna beams are characterized obtained from realistic antenna patterns. We compare the performance of CaDMAC and CaRP with existing MAC and routing protocol, namely DMAC and DSR. At low sending rates the benefits of capture awareness are not evident. As the sending rates increase, the network begins to saturate earlier with DMAC and Circular-MAC.

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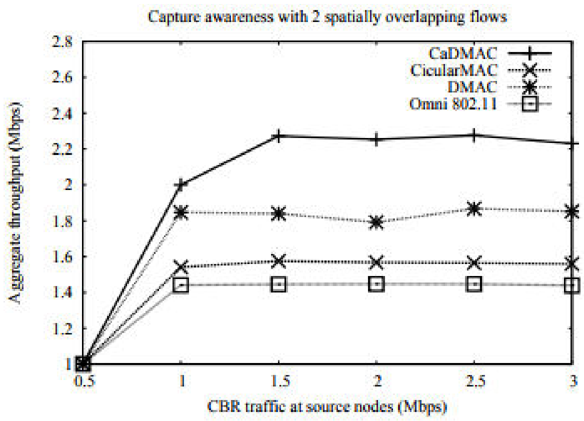

Fig. 5. CaDMAC improves the simple scenario

6. CONCLUSION

We have proposed a local metric and corresponding joint power control and routing method chanism in wireless networks. We provide one way of resolving capture at the MAC and the network layer. We take stationary mesh networks with relatively persistent route patterns; our protocols is improve spatial reuse. We propose DCAR the first distributed coding-aware routing system for wireless networks. DCAR is an on-demand and link state routing protocol it incorporates potential coding opportunities into route selection using the "Coding+Routing Discovery" and DCAR also adopts a more generalized coding scheme by eliminating the "two-hop" limitation in COPE . Furthermore, JDRPC is providing a great reduction in power usage compared to channel unaware routing algorithms. We have also shown that JDRPC algorithm also adapts to transmission power limitation of wireless devices. There are many future research directions to build only focus on relatively stable networks.

7. REFERENCES

[1] A. Adya, P. Bahl, J. Padhye, A. Wolman, and L. Zhou, "A multi-radio unification protocol for IEEE 802.11 wireless networks," in Proc. 1st Int. Conf. Broadband Netw., 2004, pp. 344–354.

[2] Karim Seada, Marco Zuniga, Ahmed Helmy, Bhaskar Krishnamachari, "Energy Efficient Forwarding Strategies for Geographic Routing in Wireless Sensor Networks," ACM Sensys, 2004.

[3] D. Ganesan, B. Krishnamachari, A. Woo, D. Culler, D. Estrin and S. Wicker. "Complex Behavior at Scale: An Experimental Study of Low-Power Wireless Sensor Networks". UCLA CS Technical Report UCLA/CSD-TR 02-0013, 2002.

[4] C. E. Jones, K. M. Sivalingam, and P. Agrawal, "A survey of energy efficient network protocols for wireless networks," ACM Journal of Wireless Networks (WINET), vol. 7, no. 4, July 2001.

[5] I. F. Akyildiz, W. Sue, Y. Sankarasubarmaniam, and E. Cayirci, "A survey on sensor networks," IEEE Communications Magazine, vol. 40, no. 8, pp. 102–114, August 2002.

[6] I. F. Akyildiz, X. Wang, and W. Wang, "Wireless mesh networks: a survey," Computer Networks, vol. 47, no. 4, pp. 445–487, March 2005.

[7] R. Ahlswede, N. Cai, S. Li and R. Yeung. Network Information Flow. IEEE Trans. on Informaion Theory, 46(4), pp. 1204-1216, July 2000.

[8] B. Ni, N. Santhapuri, Z. Zhong and S. Nelakuditi. Routing with Opportunistically Coded Exchanges in Wireless Mesh Networks. Poster session of SECON 2006.

[9] D.B. Johnson, D.A. Maltz, in Mobile computing (Springer, 1996), pp. 153–181.