Scope International Journal of Science, Humanities, Management and Technology. ISSN : 2455-068X
Vol.3 Issue 4 (2017) 94 - 98. Submitted 01/11/2017. Published 13/12/2017

OPPORTUNITY ROUTING WITH CONGESTION DIVERSITY IN WIRELESS AD-HOC NETWORK

[1]V. Saranya, M.Phil Scholar, Bharathiyar Arts And Science College For Women, Deviyakurichi, Thalaivasal, Salem,

[2]C. Tamilselvi, Asst. Professor, Bharathiyar Arts And Science College For Women, Deviyakurichi, Thalaivasal, Salem.

Abstract:

A distributed adaptive opportunistic routing scheme for multihope wireless ad hoc networks is proposed. The proposed scheme utilizes a reinforcement learning frame- work to opportunistically route the packets even in the ab- sence of reliable knowledge about channel statistics and network model. This scheme is shown to be optimal with respect to an expected average per-packet reward criterion. The proposed routing scheme jointly addresses the issues of learning and routing in an opportunistic context, where the network structure is characterized by the trans- mission success probabilities. In particular, this learning framework leads to a stochastic routing scheme that optimally “explores” and “exploits” the opportunities in the network.

Keywords: Adaptive opportunistic routing scheme, Channel statistics, Network model.

1. INTRODUCTION

Opportunistic routing for multichip wireless ad hoc net- works has seen recent research interest to overcome deficiencies of conventional routing as applied in wireless setting. Motivated by classical routing solutions in the Internet, conventional routing in ad hoc networks attempts to find a fixed path along which the packets are forward- ed. Such fixed-path schemes fail to take advantage of broadcast nature and opportunities provided by the wire- less medium and result in unnecessary packet retransmissions. The opportunistic routing decisions, in contrast, are made in an online manner by choosing the next relay based on the actual transmission outcomes as well as a rank ordering of neighboring nodes. Opportunistic rout- ing mitigates the impact of poor wireless links by exploiting the broadcast nature of wireless transmissions and the path diversity.The opportunistic algorithms depend on a precise probabilistic model of wireless connections and local topology of the network. comprehensive study and evaluation of any opportunistic routing scheme requires an integrated approach to the is- sue of probability estimation. Authors provide a sensitivity analysis for the opportunistic routing algorithm. Howev- er, by and large, the question of learning/estimating channel statistics in conjunction with opportunistic routing remainsunexplored. In this paper, we first investigate the problem of opportunistically routing packets in a wireless multichip network when zero or erroneous knowledge of transmission success probabilities and network topology is available. Using a reinforcement learning framework, we propose a distributed adaptive opportunistic routing algorithm (d-Adaptor) that minimizes the expected av- erage per-packet cost for routing a packet from a source node to a destination.

2. RELATED WORK

The rapid growth of Internet has made communication an integrated and highly important factor of computing. In today's society with the development of mobile devices it has become important to stay online all the time. In order to stay online all the time it must be possible to set up a network fast and cost effective when moving between different infrastructures, ad hoc networks deals with this kinds of issues. Furthermore in military operations or af- ter environment disaster it is important to establish com- munication fast in addition it is highly probable the ex- isting infrastructure has been destroyed. After the ad hoc network has been established the nodes that connect the network might move, say for example that one military squad is under heavy attack and has to escape. In ad hoc networks nodes should be able to move freely and the in- formation should be routed through new paths after old ones have been broken, the network should also be able to handled clustering. The advent of ad hoc network has given birth to new kinds of routing algorithms and new security threats.More complications arise in ad hoc wire- less networks because the components usually have much lower capacity than their wired counterparts, this gives makes congestion and overload common rather than an exception which it is in wired networks. Due to the fact that ad hoc networks should be possible to establish in tough context, factors such as noise and disturbance play a major role in the design. Markov decision theoretic formulation for opportunistic routing is developed. It is shown that the optimal rout- ing decision at any epoch is to select the next relay node based on a distance-vector summarizing the expected- cost-to-forward from the neighbors to the destination. This “distance” is shown to be computable in a distributed manner and with low complexity using the probabilistic description of wireless links. A unifying framework for almost all versions of opportunistic routing such as SDF, Geographic Random Forwarding (GeRaF) , and ExOR , where the variations in are due to the choices of cost measures to optimize. For instance, an optimal route in the context of ExOR is computed so as to minimize the expected number of transmissions (ETX), while GeRaF uses the smallest geographical distance from the destina- tion as a criterion for selecting the next-hop.

3. PROPOSED SYSTEM

In this paper we propose a distributed adaptive oppor- tunistic routing algorithm (d-AdaptOR) that minimizes the expected average per-packet cost for routing a packet from a source node to a destination. Assumes no knowl- edge about the channel statistics and network. Uses a reinforcement learning framework in order to enable the nodes to adapt their routing strategies, optimally exploits the statistical opportunities and receiver diversity. The following screen shows an input box, we enter the ID of the node in order to create a anode then in the next input box we have enter the value of the cost for each node in the system this step should be repeated as many as we want to create nodes. before transmission and routes all the packets through it, to opportunistic approaches which make routing deci- sions adaptively based on actual transmission outcomes. We compare the stable rate region of both the approaches and find, interestingly, that opportunistic routing schemes do not always support a larger stable-rate region than tra- ditional routing protocols.Backpressure based schemes are known tobe throughput optimal but compromise on delay performance instead. We study the behavior of various schemes and propose a routing policy that considers both the goals of throughput optimality and minimizing expected delay in its design.

Fig.1.HOC Networks

This is achieved by both sufficiently exploring the net- work using data packets and exploiting the best routing opportunities. Our proposed reinforcement learning framework allows for a low-complexity, low-overhead, distributed asynchronous implementation. The significant characteristics of AdaptOR are that it is oblivious to the initial knowledge about the network, it is distributed, and it is asynchronous.

4. ANALYSIS

There are a lot of learning-based routing solutions both heuristic and analytically driven for conservative routing in wireless or wired networks. None of these solutions uses the receiver range gain in the context of opportunistic routing.

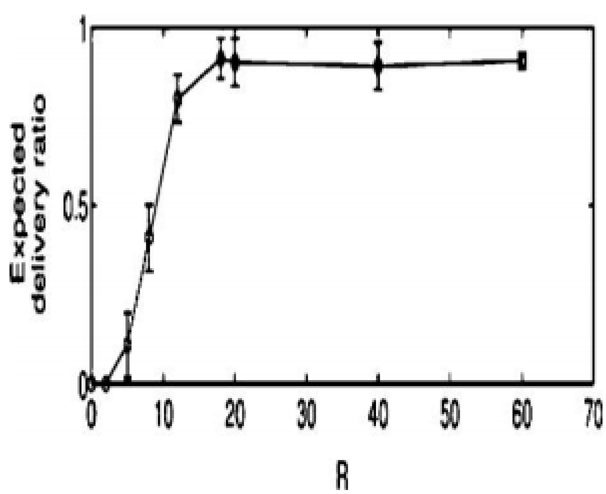

Fig.2.Graph delivery ratio

We focus on heuristic routing algorithms that adaptively identify the least congested path in a wired network. If the network congestion, therefore delay, were to be replaced by time-invariant quantities, the heuristics in would become a special case of d-AdaptOR in a network with deterministic channels and with no receiver diversity. In, analytic results for ant routing are obtained in wired networks without opportunism. Ant routing make use of ant-like probes to find paths of best possible costs such as expected delay, hop count and packet loss probability.

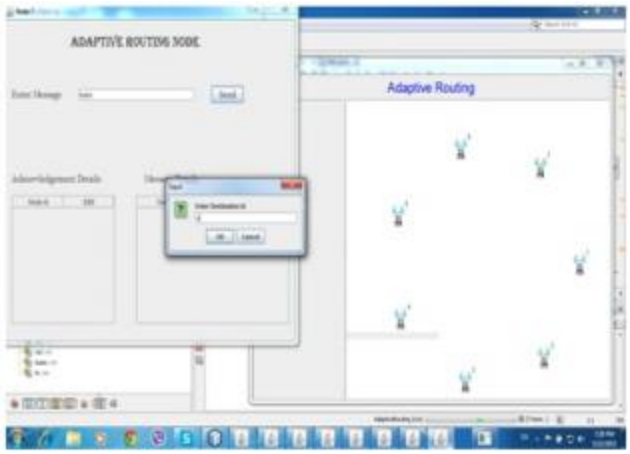

Fig.3.Node analysis

This dependence on ant-like probing corresponds to a stark difference with our move toward where d-AdaptOR relies solely on data packet for exploration. Let indicate this random reward obtained at the termination time, i.e., either zero if the packet is crashed prior to reaching the destination node or if the packet is received at the destination. Let denote this random reward attained at the termination time, i.e., moreover zero if the packet is dropped prior to reaching the destination node or if the packet is received at the destination. Here we have first investigated the problem of opportunistically routing packets in a wireless multihop network when zero or erroneous knowledge of transmission success probabilities and network topology is available. Using a reinforcement knowledge framework, we propose a disseminated adaptive opportunistic routing algorithm (d-AdaptOR) that minimizes the expected average per-packet cost for routing a packet from a source node to a destination. This is accomplished by both sufficiently exploring the network with data packets and exploiting the best routing opportunities. Our projected reinforcement learning framework allows for a low-overhead, low- complexity and distributed asynchronous implementation.

CONCLUSION

We proposed d-AdaptOR, a distributed and opportunistic routing algorithm whose performance is shown to be optimal with zero knowledge regarding network topology and channel statistics. More precisely, under idealized assumptions, d-AdaptOR is shown to achieve the performance of an optimal routing with perfect and centralized knowledge about network topology, where the performance is measured in terms of the expected per-packet reward capture the performance of various adaptive schemes, however, it is desirable to study the performance of the algorithms over a finite horizon. Regret is a function of horizon that quantifies the loss of the performance under a given adaptive algorithm relative to the performance of the topology-aware optimal one. More specially results so far implies that the optimal rate of growth of regret is strictly sub linear in, but fails to provide a conclusive understanding of the short-term behavior of d-

AdaptOR. An important area of future work comprises developing adaptive algorithms that ensureoptimal growth rate of regret.

REFERENCES

[1] C. Lott and D. Teneketzis, "Stochastic routing in ad hoc wireless networks," in Proc. 39th IEEE Conf. Decision Control, 2000, vol. 3,pp. 2302–2307, vol. 3.

[2] P. Larsson, "Selection diversity forwarding in a multihop packet radio network with fading channel and capture," Mobile Comput. Commun Rev., vol. 2, no. 4, pp. 47–54, Oct. 2001.

[3] M. Zorzi and R. R. Rao, "Geographic random forwarding (GeRaF) for ad hoc and sensor networks: Multihop performance," IEEE Trans. Mobile Comput., vol. 2, no. 4, pp. 337–348, Oct.–Dec. 2003.

[4] S. Biswas and R. Morris, "ExOR: Opportunistic multi-hop routing for wireless networks," Comput. Commun. Rev., vol. 35, pp. 33–44, Oct. 2005.

[5] S. Jain and S. R. Das, "Exploiting path diversity in the link layer in wireless ad hoc networks," in Proc. 6th IEEE WoWMoM, Jun. 2005, pp. 22–30.

[6] C. Lott and D. Teneketzis, "Stochastic routing in ad hoc networks," IEEE Trans. Autom. Control, vol. 51, no. 1, pp. 52–72, Jan. 2006.