Multi Parameter Analysis In Identification Of Cooperative Relay Routing Based On Capacity, Cost & Throughput In Wsn

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Abstract: The system performing routing misbehaviour, a malicious node can intentionally send unnecessary route error messages to misguide its neighbours and for also increasing the percentage of congestion in the network. In the paper, we propose sub cooperative route selection algorithm to overcome the pre-mentioned problems. During route discovery, a source node broadcasts an RREQ packet. Once the RREQ is received and verified by the destination node, the destination node assembles an RREP packet and broadcasts it back to the source node based on relay node capacity. Each relay node validates the RREP packet and updates its routing tables. When the source node receives the RREP packet and updates its routing tables. The source node starts data transmissions in the established route. In the MODIFICATION part of the Project, we select best route along with calculating capacity, Cost & Throughput of all the Available Routes. Based on all these factors Best Route is identified & Packets are transmitted.

Keywords: RREQ, RREP

I. INTRODUCTION

Network security consists of the policies and practices adopted to prevent and monitor unauthorized access, misuse, modification, or denial of a computer network and network-accessible resources. Network security involves the authorization of access to data in a network, which is controlled by the network administrator. Users choose or are assigned an ID and password or other authenticating information that allows them access to information and programs within their authority. Network security covers a variety of computer networks, both public and private, that are used in everyday jobs; conducting transactions and communications among businesses, government agencies and individuals. Networks can be private, such as within a company, and others which might be open to public access. Network security is involved in organizations, enterprises, and other types of institutions. It does as its title explains: It secures the network, as well as protecting and overseeing operations being done. The most common and simple way of protecting a network resource is by assigning it a unique name and a corresponding password. The aim of our project is to avoid link breakage and detect faulty node, calculate the capacity, throughput and cost. Finally identify the best route based on those factors.

In recent years, we have seen significant research interests in exploiting cooperative communications (CC) over distributed antennas to improve the transmission performance Taking advantage of the broadcast nature of wireless channels, one or more neighbouring nodes can serve as relays and forward overheared packets from a sender to its target receiver, which can combine multiple copies of the packet to decode the original one. Therefore, by exploiting the inherent spatial and multiuser diversities, the cooperative communication technique can efficiently improve the network performance. This makes cooperative communications an emerging technique for future wireless networks. Existing studies on CC are mostly based on single-radio networks. With the constant reduction of hardware cost and the availability of cheap, off-the-shelf commodity hardware equipped with multiple radios, more and more wireless devices are equipped with multi radio communication interfaces. This not only brings in the extra capacity gain for a single device and a wireless network formed with multi radio nodes, but also creates more opportunities for CC. Although promising, there are very limited studies on exploiting the multi radio capabilities for flexible CC to improve the multi radio multi hop wireless network performance. This paper intends to provide some design guidelines and demonstrate the benefits of CC in multi radio multi hop wireless networks. The existence of multi radio devices in the network allows for more transmission opportunities and
flexibilities, but also leads to more challenges in network design, especially the enabling of CC in multi radio multi hop networks. With more radio interfaces, a node in the network can act not only as a cooperative relay for CC but also a transmission relay for multi hop packet forwarding.

II. LITERATURE REVIEW

A. Cooperative Relay In Cognitive Radio Networks: Decode-And-Forward Or Amplify-And-Forward, Donglin Hu and Shiwen Mao Dept. ECE, Auburn University, Auburn, AL 36849-5201

In this paper, they investigate the problem of cooperative relay in CR networks for further improved network performance. The objective is to provide an analysis for the comparison of two representative cooperative relay strategies, decode and forward (DF) and amplify and forward (AF), in the context of CR networks.

B. Throughput Improvement By Joint Relay Selection And Link Scheduling In Relay-Assisted Cellular Networks, Zexi Yang, Qian Zhang, Fellow, IEEE, and Zhisheng Niu, Fellow, IEEE

In this paper they proposed the idea of joint relay selection and link scheduling to maximize the network throughput in relay-assisted cellular networks. The spatial reused into two forms. The first form of spatial reuse exists among second-hop links, where relay stations transmit to mobile users. The second form of spatial reuse exists between second- and first-hop links, where the base station transmits to relay stations or mobile users. A framework is proposed to decouple the joint problem into the following two sub problems: 1) a frame segmentation problem and 2) a relay selection problem. Under this framework, we propose two algorithms for either only the first form of spatial reuse exists or both forms of spatial reuse exist.

C. Interference-Aware Cooperative Communication In Multi-Radio Multi-Channel Wireless Networks, Kun Xie, Member, Ieee, Xin Wang, Member, Ieee, Xueli Liu, Jigang Wen, And Jiannong Cao, Fellow,

The aim of this work is to concurrently exploit multi-radio and multi-channel (MRMC) technique and cooperative transmission technique to combat co-channel interference and improve the performance of multi-hop wireless network. The proposed two important metrics are, contention-aware channel utilization routing metric (CACU) to capture the interference cost from both direct transmission and cooperative transmission, and traffic aware channel condition metric (TACC) to evaluate the channel load condition. The algorithms are local channel adjustment and local path and relay adaptation respectively to ensure high performance communications in dynamic wireless networks. algorithms for either only the first form of spatial reuse exists or both forms of spatial reuse exist.

D. Routing Metrics For Minimizing End-To-End Delay In Multi-Radio Multi-Channel Wireless Networks, Hongkun Li, Yu Cheng, Chi Zhou And Weihua Zhuang

This paper studies how to select a path with the minimum expected end-to-end delay (EED) in a multi-radio multi-channel (MRMC) wireless mesh network. A generic iterative approach to compute the multi-radio achievable bandwidth (MRAB) for a path, taking the impact of inter/intra-flow interference and space/channel diversity into consideration. The MRAB is then combined with the EED to form the metric weighted end-to-end delay (WEED). As a by product of MRAB, a channel diversity coefficient is defined to quantitatively represent the channel diversity for a given path. Moreover, the implementation of a distributed WEED-based routing protocol for MR-MC wireless networks by extending the well-known AODV protocol.

E. Adaptive Scheduling In Mimo-Based Heterogeneous Ad Hoc Networks, Shan Chu, Xin Wang Member, Ieee, And Yuanyuan Yang Fellow, Ieee.

In this work, we propose a holistic scheduling algorithm that can adaptively select different transmission strategies based on the node types and channel conditions to effectively relieve the bottleneck effect caused by nodes with smaller antenna arrays, and avoid the transmission failure due to the violation of lower degree of freedom constraint resulted from the channel dependency. The algorithm also takes advantage of channel information to opportunistically schedule cooperative spatial multiplexed transmissions between nodes and provide special transmission support for higher priority nodes with weak channels, so that the data rate of the network can be maximized while user transmission quality requirement is supported.

EXISTING SYSTEM

In EXISTING SYSTEMS, performing routing misbehaviour, a malicious node can intentionally send unnecessary route error messages to misguide
its neighbours and for also increasing the percentage of congestion in the network.

**DISADVANTAGES:**
- Less security
- Congestion occurring

**PROPOSED SYSTEM**

In the **PROPOSED SYSTEM,** we propose sub cooperative route selection algorithm to overcome the pre-mentioned problems. During route discovery, a source node broadcasts an RREQ packet. Once the RREQ is received and verified by the destination node, the destination node assembles an RREP packet and broadcasts it back to the source node based on relay node capacity. Each relay node validates the RREP packet and updates its routing tables. When the source node receives the RREP packet and updates its routing tables. The source node starts data transmissions in the established route.

**MODIFICATION PROCESS**

In the **MODIFICATION** part of the Project, we select best route along with calculating capacity, Cost & Throughput of all the Available Routes. Based on all these factors Best Route is identified & Packets are transmitted.

**ADVANTAGES:**
- More security
- Cost is effective
- Easily identify the best route

**III. SYSTEM DESCRIPTION**

The first challenging issue is how to assign relay nodes (either for CC or as a multi hop relay) for each session. Fig. 1 shows examples of CC with each node equipped with two radios, where the dashed lines represent cooperative transmissions. In, the node could use one radio as cooperative relay for session, and the other radio as cooperative relay for session . In, the node could use one radio as cooperative relay for session and the other radio as a multi hop relay for session. The capability for a node or a radio interface to serve as two different types of relay makes multi radio cooperative routing and relay node assignment inter-dependent. The second challenging issue is how to solve the coupled multi radio routing problem and relay assignment problems optimally together while taking into account the wireless interference arisen from both direct transmission and cooperative communication. To address the above challenging issues, the aim of this work is to solve a joint problem of multi radio cooperative routing and relay assignment to understand the benefits of applying CC in multi radio multi hop wireless networks. Compared to conventional single-radio CC studies, the introduction of multi radio nodes significantly increases the flexibility in relay selection thus the performance gain as demonstrated in our performance evaluations. However, this also makes the problem much harder to solve. The objective of our work is to maximize the minimum rate among a set of concurrent communication sessions to increase the transmission fairness by considering the opportunities brought by cooperative communications and the limitation of the number of radios at network nodes.

The following are the modules of the project, which is planned in aid to complete the project with respect to the proposed system, while overcoming existing system and also providing the support for the future enhancement

**A. NETWORK CONSTRUCTION**

We create a network topology to avoid security problem. Network has many number of node details. It maintains the connection details also. Nodes are interconnected and exchange data with other nodes. Nodes are connecting with other nodes in the network. Network server maintains the node’s IP Address, Port details and Status. Node give request to server and get the needed response from server.

**B. ROUTING TABLE**

In this module the network will determine the flexible path to transfer the data from the source node to the destination node. There will be many paths will be available from source node to the destination node. So that the data will be transferring via the path which has the highest connectivity so that the data will reach the destination node in reliable manner.
C. **RUNTIME COST IDENTIFICATION**
In this module the network will determine the flexible path to transfer the data from the source node to the destination node. There will be many paths will be available from source node to the destination node. So that the data will be transferring via the path which has the highest connectivity so that the data will reach the destination node in reliable manner. So for every node has their energy and cost of that node is calculated so that based on the cost we can send the data and it choose the shortest path. Will lead to no packet loss in the network.

D. **CAPACITY & THROUGHPUT CALCULATION**
A typical method of performing a measurement is to transfer a 'large' file from one. The throughput is then calculated by dividing the file size by the time to get. The Reasons for measuring throughput in networks: People are often concerned about measuring the maximum data throughput in bits per second of a communications link or network access. A typical method of performing a measurement is to transfer a 'large' file from one system to another system and measure the time required to complete the transfer or copy of the file. The throughput is then calculated by dividing the file size by the time to get the throughput in megabits, kilobits, or bits per second.

E. **BEST ROUTE IDENTIFICATION**
The modification that we are doing in this project is Capacity Calculation. If the Source node wants to send the data to the destination node via flexible paths and there are many flexible paths are available to send the data to the destination node. At this time we are calculating the capacity of the available paths. So that which path is having the highest capacity, so that the data will be sends to via that path to the destination node.

IV. **CONCLUSION**
This paper studies a joint problem of cooperative routing and relay assignment in multi hop and multi radio networks to maximize the minimum rate among a set of concurrent communication sessions. We first model this problem as an MIP problem and prove it to be NP-hard. Then, we propose a centralized algorithm and a distributed algorithm to solve the problem. The centralized algorithm can guarantee the finding of a global-optimal solution. The distributed algorithm can be applied to find an efficient cooperative route with polynomial complexity. We have done extensive simulations to evaluate the performance, and our results demonstrate the effectiveness of the proposed algorithms and the significant rate gains that can be achieved by incorporating CC in multi radio multi hop networks. Although we use AF as the CC mode in this paper, it is worth pointing out that our algorithms do not depend on specific CC mode to function. In future work, one or more neighbouring nodes can serve as relays and forward overheard packets from a sender to its target receiver, which can combine multiple copies of the packet to decode the original one. Therefore, by exploiting the inherent spatial and multiuser diversities, the cooperative communication technique can efficiently improve the network performance. This makes cooperative communications an emerging technique for future wireless networks.
REFERENCES


