Cluster Based Routing and Multicast Scheduling Algorithms for Relay Networks

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Abstract: **The rapid development of audio and video applications such as Skype and YouTube increases people's demands for ubiquitous high-data-rate coverage. We used Orthogonal Frequency Division Multiple Access (OFDMA) relay-enhanced cellular network, the integration of multi hop relaying with OFDMA infrastructure, has become one of the most promising solutions for next-generation wireless communications. We propose a collaborative multi-hop routing algorithm combined with clustering to improve network performance. To build the multi-hop routing with maximum achievable rate. the result shows that it balances the load of the network and deals with the change effectively of the network topology, and also improves the reliability, throughput and stability of the network efficiently.**

Key words: **Hybrid routing, OFDMA, relay networks, TCP, DVMA, clustering**

I. INTRODUCTION

Nowadays, due to the rapid developments of audio and video applications such as Skype and You Tube, people's demands for high-data-rate wireless access are increasing. To provide ubiquitous high-data-rate coverage, advanced signal processing techniques such as OFDMA are developed. However, due to the path loss of propagation, those advanced techniques can not improve data rates for cell-edge users, namely users far from the BS.The most widely used strategy to address this problem is to shrink the size of cells to increase the density of BSs. However, the benefit of this strategy is limited by the exceeding cost of deploying a BS since the service provider must pay for not only the antenna space but also the wired backhaul connection. Multi hop relaying is considered to be a more attractive solution since relay stations do not need wired backhaul. One the other hand, the flexibility in relay positioning allows a faster network construction. Therefore, OFDMA relay-enhanced cellular network is a promising solution for the next-generation communications.To implement OFDMA relay-enhanced network, resource allocation is one of the issues remained for our researchers, manufacturers and service providers to investigate. To gain the potential capacity and coverage improvements of multi hop relaying, the resource allocation problem becomes more complicated and crucial. Although many studies have been done on adaptive resource allocation in single-hop OFDMA cellular systems they can't be used directly in the multi hop system, since in the multi hop system, resource allocation on diff erent hops should be cooperated to avoid data shortage or overflow in relay nodes. In multipath routing, traffic bound to a destination is split across multiple paths to that destination. In other words, multipath routing uses multiple "good" paths instead of a single "best" path for routing. Multipath routing aims to establish multiple paths between source-destination pairs and thus requires more hosts to be responsible for the routing tasks. The advantage of multipath is not obvious in MANET because of the traffic along different feature of radio transmission. Some protocols in MANET such as the Dynamic Source Algorithm (DSR) [13], and Temporally Ordered Routing Algorithm (TORA) [15], use multiple paths. However, the Multi paths are utilized as a backup of auxiliary method in these protocols. In order to explore the benefits of multipath routing in MANET.

II. EXISTING SYSTEM

Two-hop relay-enabled wireless networks have become a dominant, mandatory component in the 4G standards, due to envisioned applications (hotspots, office buildings, underground tunnel access, etc.) they support,

1. Only return a single channel quality value.

2. No multicast scheduling.

Are the disadvantages, farther extended by using two hop relay network with multicasting scheduling algorithm relay station only do the work of reporting. Hence the

proposed system could be efficiently used with the combination of OFDMA relay network and their cooperation with each other with addition of dynamically changing the route rather than reporting the failure to specific server or client.

In the existing multicasting algorithms have some drawbacks such as congestion occurrence, reliability, through put. not efficient change of the network.

III. PROPOSED SYSTEM

We propose a collaborative multi-hop routing algorithm combined with clustering to improve network performance. To build the multi-hop routing with maximum achievable rate.

A clustering-based path strategy is presented to create the effective next-hop link. It distributes traffic among diverse multiple paths to avoid congestion. And then by clustering and collaboration, a multi-hop routing with maximum achievable rate is successfully built. The effectiveness and the feasibility of the proposed methods are verified by simulation results. It uses clustering's hierarchical structure diverse to decrease routing control overhead and improve the networks scalability. Here, we compare CBMMRP and a multipath algorithm named Split multipath routing (SMR) with plane structure. And also we compare CBMMRP with unipath routing (AODV). Both of the ways are all under different speeds.

In clustering mechanism Number of stations are divided into number of clusters, these clusters are connected with the base station (BS) and the Base Stations connected with Main Station (MS),

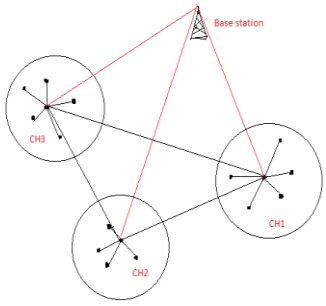

Fig. Schematic diagram of clustering mechanism

In the above diagram nodes are divided into three clusters these clusters are connected to the Base station BS Sending Data from source to destination can be described in the fallowing diagram

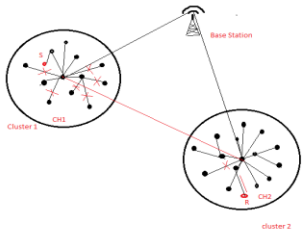

Fig: sending Data Based on clustering

The above figure contains two clusters which contains somenodes and the base station BS sender S need to send Data or some message to Receiver or destination in group 1 it checks all conceivable outcomes for sending information however it happens some connection disappointments ,yet not happen any destination it requires then it insinuate the base station it get the authorization from base Station it ,checks the potential outcomes for the destination in the second group it get the destination.

Utilizing the bunching Huge measure of Routers present in the system it is hard to accomplish the above strategies ,when changing the system additionally it gets dependable exchange of information to the destination.

Advantages:-

- No congestion.
- It balances the load of the network
- It deals with the change effectively of the network topology,
- It improves the reliability, throughput and stability of the network efficiently

IV. RELATED WORK

DVMA repeats the following three steps as long as .

1) Select a destination node.

2) Find a "good" path from a node to that uses no nodes in other than , and no links in .

3) Construct a new tree by including all nodes and links of this path to the initial tree , and update to exclude and any other destination nodes along this path.

Socket Programming:

In C# the network programming through its namespaces likes System.Net and System.Net.Sockets. A Socket is an End-Point of to and From (Bidirectional) correspondence connection between two projects (Server Program and Client Program) running on the same system. We require two projects for conveying an attachment application in C#. A

Server Socket Program (Server) and a Client Socket Program (Client).

Server Socket Program: A C# Server Socket Program running on a PC has an attachment that bound to a Port Number on the same PC and listening to the customer's approaching solicitations.

Client Socket Program: A C# Client Socket Program need to know the IP Address (Hostname) of the PC that the C# Server Socket Program lives and the Port Number dole out for listening for customer's solicitation .

V. CLUSTER BASED MULTI-HOP MULTIPATH ROUTING PROTOCOL

All the nodes in the networks are equity, and functions as terminal as well router. There is difference in performance instead of function. The main advantage of the structure is that there are multiple paths between source-destination pairs. So it can distribute traffic into multiple paths, decrease congestion and eliminate possible "bottleneck". But MANET with the plane structure will increase routing control overhead, the scalability problem is likely to happen. Utilizing clustering algorithm to construct hierarchical topology may be a good method to solve these problems. An adaptive mobile cluster algorithm can sustains the mobility perfectly and maintains the stability and robustness of network architecture. To support the multihop and mobile characteristics of wireless ad hoc network, the rapid deployment of network and dynamic reconstruction after topology changes are effectively implemented by clustering management. Clustering management has five outstanding advantages over other protocols. First, it uses multiple channels effectively and improves system capacity. Second, it reduces the exchange overhead of control messages and strengthens node management Third, it is very easy to implement the local synchronization of network. Fourth, it provides quality of service (QoS) routing for multimedia services efficiently Finally, it can support the wireless networks with a large number of nodes. Therefore, combining the multipath of the MANET with cluster hierarchical topology, we propose a new protocol named Clusterbased Multihop Multipath Routing (CBMMRP).

Source algorithm:

If M is a source member of cluster C1 hears the request message, then

1) It sets up multiple paths from source node S to next hop nodes D;

2) Then sets up multiple path from the source nodes to destination node D.

3) It selects all the reliable link disjoint paths from S to D($P \geq Plower$, where P is reliability and Plower is lowest reliability).

4) If all paths have been established, then it chooses the maximal disjoint and loop-freedom reliable paths that satisfies above conditions.

Destination algorithm:

If destination node D is not in the same cluster as source node S, then

1) Source node S sends a route request message(RREQ)to its cluster head CH.CH looks for which cluster the destination node D belongs to, At the same time, it sets up multiple links from source node S to the destination nodes as next hop address, the hop of the links is likely more than one.

2) Cluster head CH sends the RREQ message to its downstream cluster CH1. Once CH21receives this message, it will send the RREQ to next cluster and report the IP addresses of its cluster members to CH1 at one time.

3) Then, it sets up disjoint links;

4) Once CH1 receives the message, CH1 reports the addresses of its cluster, and passes the RREQ next hop;

5) It sets up links from the members of as source nodes to the members of cluster as destination nodes as next hop addresses, and chooses the links that satisfies the reliability request. the hop of the links is likely more than one;

6) When the cluster head CHm where the destination locates recieves the path request message, sends next hop address, to destination node D;

7) Finally, when all complete paths to destination node have been established, it will choose all maximal disjoint, loopfreedom reliable paths that satisfy above conditions based on hop number and bandwidth. The above paths just are possible routes, we call them virtual routes.

VI. CONCLUSION

Based on the problems of multicast scheduling in two-hop OFDMA relay networks We propose a collaborative multi-hop routing algorithm combined with clustering to improve network performance. To build the multi-hop routing with maximum achievable rate Dynamically changing the route rather than

reporting to the source and destination may have been proving a useful change in existing system. improves the reliability, throughput and stability of the network efficiently.

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Mr. P.Radha Krishna did his Master in Computer Application at Lakkireddy Bali reddy college of engineering .He started his teaching career at Anurag Engineering College ,Kodad. Where He had guided be so many batches in their projects. He guided students in doing IBM projects at Anurag.He played an active role in the NBA Accreditation process at Anurag Engineering College in to 2007, He had acted as In charge Hod of MCA at Anurag. Mr. P Radha Krishna is a Member of ISTE, IAENG, ISRD .He had participated many workshops and paper presentations, which include sun-microsystem and open systems (LAMP) workshops .Mr. Radha Krishna is the secretary of Alumni Association of LBRCE .He is now working as the Head of the Department of CSE of Nova college of Engineering & Technology, Jupudi, Ibrahimpatnm.

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