Multichannel Exploiting using Dynamic Routing

[1] S. Priya, [2] S. Rajina Begam, [3] S. Sushmitha, [4] S. Vasantha, [5] M. Senthil Kumar M.E.,
[1234] UG Scholar, [5] Assistant professor, Department of Computer Science and Engineering,
V.S.B. Engineering college-Karur.

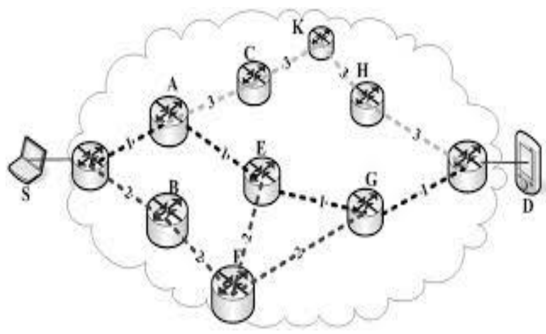
***Abstract:-* Multichannel diversity is an assistance strategy to reduce the effect of channel heterogeneity property on the multicast throughput in dynamic routing. By using intermediate server the effect was reduced. Intermediate server will balance the load and it make the path request easier and respond quickly. The dynamic path will calculate the time, bandwidth for every channel simultaneously.**

Keyword: Algorithm, Dynamic path network.

I. INTRODUCTION

Dynamic routing have emerged as a solution for the spectrum underutilization problem. The dynamic path network opportunistically utilize licensed spectrum. The dynamic path routing is the network technique that provide the optimal path routing. It enable router to select the paths according to the calculation of time and bandwidth. To find the available path multipath routing algorithm is used. The ideal channel is calculated. findout (this is referred to as Manuscript received October 17, 2011; revised July 15, 2012; December 09,2012; and March 27, 2013; accepted April 03, 2013; approved by IEEE/ACM TRANSACTIONS ON NETWORKING Editor S. Ramasubramanian. Date of publication May 02, 2013; date of current version June 12, 2014. This work was supported in part by the National Science Foundation under Grant NSF-ECCS-0926029. This paper was partly published in the Proceedings of the IEEE International Conference on Communications (ICC), Almasaeid is with Yarmouk University, Irbid 21163, Jordan)

The dynamic routing will find the time and bandwidth for ever possible channel to send the data from source to destination. It find the path and calculate the bandwidth simultaneously for ever path available. Then multipath routing algorithm is used to find the available path i.e ideal path and send the data from source to destination which take minimum time and cost. In this method travelling sale man problem is the example .And the load is balanced by divert into the intermediate server. Dynamic routing uses the mac protocol and reduce the time delay.
If the source is equipped with a single radio, these transmissions will have to be done sequentially in order to deliver the same frame to all nodes in the receivers set. This may increase the time needed for a source to deliver the multicast frame to all receivers.
Dynamic routing allows routing tables in routers to change as the possible routes change.



A. *Multicast Scheduling Problem*

Tremendous research has been conducted on multicast in multichannel wireless networks to come up with efficient routing and/or channel allocation algorithms that maximize a number of different objectives. Energy efficiency , spectrum efficiency , throughput maximization , and delay minimization , are examples of these objectives .Multicasting in CRNs is different from that in traditional multichannel wireless networks. In traditional multichannel wireless networks, the same set of frequency channels is available at all nodes. This assumption may not hold in CRNs due to the *heterogeneity property* mentioned earlier, as illustrated . The example shows three primary users where each PU utilizes frequency channel . The gray grid-line circle around each PU represents the protection range of that PU, within which no SU is allowed to concurrently utilize (transmit or receive) the frequency channel with the PU. This range may be determined based on different criteria. One criterion, for example, is to guarantee certain bit-error-rate performance for PUs. Also, six SUs exist in the network where one of them acts as a multicast source, while the others act as multicast receivers. Note how them geographical distribution of the nodes affects the channel availability at different SUs (represented by the set shown besides each SU). This difference forces the source SU to transmit the multicast data over the three frequency channels in order to cover all the multicast receivers. The temporal part of the *heterogeneity property* is attributed to the channel usage distribution of PUs. For example, assume that at some point in time, is not using its frequency channel (i.e., channel 2). Then, all SUs will be able to use that channel, and consequently the source SU will be able to transmit themulticast data to all receivers over the same channel, i.e., channel 2. On the other hand, when the PU is back on the channel, SUs need to vacate it. This makes it a must for any scheduling algorithm to have a failure recovery plan.We refer the reader to for more details this issue. The timescale of channel availability is highly dependent on the wireless service, its coverage radius, spatial distribution of service users, and the temporal utilization of the service by those users. For example, TV channels that are not utilized in a particular region means that those channels are available all the time for SUs in that region. On the other hand, if the channels are utilized for a few hours during the day, then they are available for SUs during the rest of the day. Knowing the time span of both temporal and spatial channel availabilities requires conducting experiments in the area of interest to survey channel statistics or estimating those time spans in real time .

B. Contributions

We address the multicast scheduling problem in CR-WMNs in three phases. In the first phase, we study the scheduling of the multicast activity within a single cell, as defined in the Introduction. The contributions related to this phase are twofold. First, we proposed a scheduling strategy that exploits diversity in channel availability to enhance multicast throughput.

Second, we proposed a centralized implementation of the proposed scheduling strategy within a single cell. In the second phase, we study the issue of resolving potential conflict between the schedules of adjacent cells. We propose two solutions to guarantee collision-free schedule for the entire network: reactive collision resolution and proactive collision avoidance. In the last phase, we propose a recovery algorithm to cope with the transmission failures due to PU activities. We finally evaluate the performance of the proposed algorithms and the effect of different network parameters on the achievable gain. Throughout this paper, we define gain as the percentage reduction in the multicast period.

II. RELATED WORK

In this section, we review related work. We first review the related work on multicast in multipath routing. Then, we review the related work on network coding and its applications in multipath routing.

Network Coding in multipath:

Network coding, has emerged as a very promising technique to enhance multicast throughput and provide protection and survivability in wireless networks.

A. Proactive Approach

This approach guarantees collision-free schedules. Therefore, no post-scheduling phase needed. Moreover, it is simple to implement. However, this approach may limit the potential gain of the proposed assistance mechanism because some cells may not be able to utilize the full set of channels available to its nodes (to avoid collisions with adjacent cells). Furthermore, maintaining up-to-date channel usage information across adjacent cells incurs communication overhead

.

***Algorithm 2*: Proactive Collision-Avoidance**

1 **if** *an MR a0 needs to activate the multicast schedule of cell I* **then**

2 It broadcasts a scheduling request packet to all adjacent MRs (those managing adjacent cells);

3 **if** *all adjacent MRs accept the request by sending a positive acknowledgment* **then**

4 Activate the schedule in the next frame;

5 Inform all adjacent MRs about the used channels in each slot;

6 **else**

7 Retry the activation in the next frame

8 **if** *MR a0 receives a scheduling request from an adjacent MR*

then

9 **if a0** *is trying to activate its schedule in the current frame* **then**

10 **if** *cell i has a higher priority than cell j* **then**

11 a0 replies with a *negative* acknowledgment to;

12 **else**

13 a0 sends a *positive* acknowledgment to a1 ;

14 a0 aborts the schedule activation and retries in the next frame;

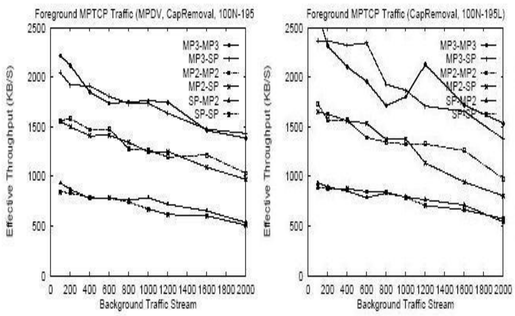
15 **else**

16 a0 sends a *positive* acknowledgment to a1 ;

IX. PERFORMANCE EVALUATION

In this section, we evaluate the performance of the proposed assistance and collision resolution mechanisms. To evaluate the performance of the HAMS algorithm, we implemented it using the C# programming language. Different network topologies were generated and fed to this program to evaluate the gain of the HAMS algorithm. Also, we developed an in-house Java simulator to evaluate the schedule recovery and collision avoidance algorithms between adjacent cells.

Before presenting the results, we illustrate the channel availability models we used in our simulations. In this section, will denote the number of multicast sessions.



REFERENCES

[1] M.Almasaeid,E.Kama"Expoliting multichannel diversity for cooperative multicast in cognitive radio mesh networks"Networking,vol-22,no.3,june 2014.

[2] I. F. Akyildiz,W.-Y. Lee, M. C. Vuran, and S. Mohanty, "Next generation/ dynamic spectrum access/cognitive radio wireless networks: A survey," *Comput. Netw.*, vol. 50, no. 13, pp. 2127–2159, 2006.

[3] K. R. Chowdhury and I. F. Akyildiz, "Cognitive wireless mesh networks with dynamic spectrum access," *IEEE J. Sel. Areas Commun.*, vol. 26, no. 1, pp. 168–181, Jan. 2008.

[4] C. Fragouli, J.-Y. Le Boudec, and J.Widmer, "Network coding: An instant primer," *Computer. Commun. Rev.*, vol. 36, no. 1, pp. 63–68, 2006.

[5] I.Maric and R. D. Yates, “Cooperativemulticast formaximumnetwork lifetime,” *IEEE J. Sel. Areas Commun.*, vol. 23, no. 1, pp. 127–135, Jan. 2005.

[6] T. Liu and W. Liao, “Multicast routing in multi-radio multi-channel wireless mesh networks,” *IEEE Trans. Wireless Commun.*, vol. 9, no. 10, pp. 3031–3039, Oct. 2010.

[7] H. S. Chiu, K. L. Yeung, and K.-S. Lui, “Bandwidth-guaranteed multicast inmulti-channelmulti-interface wireless mesh networks,” in *Proc. IEEE ICC*, June 2009, pp. 1–5.

[8] N. H. Lan and N. U. Trang, “Channel assignment formulticast inmultichannel multi-radio wireless mesh networks,” *Wireless Commun. Mobile Comput.*, vol. 9, pp. 557–571, Apr. 2009.

[9] G. Zeng, B. Wang, Y. Ding, L. Xiao, and M. Mutka, “Multicast algorithms for multi-channel wireless mesh networks,” in *Proc. IEEE Int. Conf. Netw. Protocols*, Oct. 2007, pp. 1–10.

[10] G. Zeng, B. Wang, Y. Ding, L. Xiao, and M. W. Mutka, “Efficient multicast algorithms for multichannel wireless mesh networks,” *IEEE Trans. Parallel Distrib. Syst.*, vol. 21, no. 1, pp. 86–99, Jan. 2010.

[11] V. Ramamurthi, S. K. C. Vadrevu, and A. Chaudhry, “Multicast capacity of multi-channel multihop wireless networks,” in *Proc. IEEE Wireless Common. Netw. Conf.*, Apr. 2009, pp. 1–

[12] A. Isazadeh and M. Heydarian, “Traffic distribution for end-to-end QoS routing with multicast multichannel services,” *J. Supercomput.*, vol. 52, pp. 47–81, 2010.

[13] M.Ma and D. H. K. Tsang, “Impact of channel heterogeneity on spectrum sharing in cognitive radio networks,” in *Proc. IEEE ICC*, May 2008, pp. 2377–2382.

[14] M.A.McHenry, P.A. Tenhula, D.McCloskey, D. A. Roberson, and C. S. Hood, “Chicago spectrum occupancy measurements & analysis and a long-term studies proposal,” in *Proc. 1st ACM TAPAS*, 2006, Art. no.

[15] S. Pagadarai and A. M. Wyglinski, “Measuring and modeling spectrum occupancy: A Massachusetts perspective,” in *Proc. Int. Symp. Adv. Radio Technol.*, Jul. 2010, Invited Presentation.

[16] S. Yin, D. Chen, Q. Zhang, M. Liu, and S. Li, “Mining spectrum usage data: A large-scale spectrum measurement study,” *IEEE Trans. Mobile Comput.*, vol. 11, no. 6, pp. 1033–1046, Jun. 2012.

[17] M. Sharma and A. Sahoo, “Residual white space distribution-based pportunistic channel access for cognitive radio enabled devices,” *Computer. Common. Rev.*, vol. 41, no. 4, pp. 427–428, Aug. 2010.

[18] A. Akbulut, T. Adiguzel, and A. E. Yilmaz, “Estimation of time-varying channel state transition probabilities for cognitive radio systems by means of particle swarm optimization,” *Radio Engineering*, vol. 21, no. 1, pp. 104–109, Apr. 2012.