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Authenticated Secure Communication for Cognitive Radio Networks

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***Abstract*— A cognitive radio(CR) is a transceiver which automatically detects available channels in wireless spectrum and accordingly changes its transmission or reception parameters. In this paper, it proposes an algorithm for the energy-efficient and spectrum- aware communications requirements in CR network. It enables each node to determine and regulate its transmission strategy to provide minimum energy consumption without sacrificing end-toend delay performance and also maximizes overall spectrum utilization. Spectrum sensing is one of the essential parameter to be considered in CR networks. Therefore, the security aspect of spectrum sensing should be addressed well. Using a Trust-Worthy algorithm, it improves the trustworthiness of the Spectrum sensing in CR-Networks. It is implemented using Network Simulator-2.**

***Keywords*- Cognitive Radio, Spectrum Sensing, Efficient Communication, System Security.**

I. INTRODUCTION

A cognitive radio (CR) is a transceiver which automatically detects available channels in wireless spectrum and accordingly changes its transmission or reception parameters . The Cognitive Radio (CR) network can be outlined from Software Defined Radio (SDR), in which frequency range, modulation type or output power can be altered by software without changing the hardware components SDR and intelligent signal processing (ISP) are two major technologies associated to define CR where, CR implies ISP at the physical layer of a wireless system and implementation of CR seems to be quite a hard task without using ISP in these higher layers. As all the OSI layers need to be flexible for CR network implementation, spectrum efficiency gains may not be optimized without optimization of all layers. CR-Networks is frequently divided into unpredictable partitions. These partitions are essentially intermittently-connected and deficient in complete end-to-end paths. Hence, spectrum-aware flooding (SAF) is more relevant for CR-Networks. In SAF, a message is first copied to a set of path nodes using available channels. Then, one of these path nodes delivers the message to the destination provided that it encounters. Clearly, if the message is tried to be copied to all paths that do not have the message the end-to-end message delay can be minimized.

II. RELATED WORK

In previous work, an algorithm was proposed for the energy-efficient and spectrum- aware communications requirements in CR network. It enables each node to determine and regulate its transmission strategy to provide minimum energy consumption without sacrificing end-to-end delay performance and also maximizes overall spectrum utilization. Spectrum sensing is one of the essential parameter to be considered in CR networks.

III. PROPOSED WORK

An Authenticated secure communication algorithm is proposed for Cognitive Radio Networks(CRN). The proposed method is named as PL2 (PreLude, PostLude) method. The proposed solution is an enhancement of the original existing routing protocol to find secure routes and prevent attack on CRN. The Major concept is based on time and neighborhood parameters. This method first check for Malicious activity exists, then starts detect malicious nodes. Trust-Worthy algorithm, it improves the trustworthiness of the Spectrum sensing in CR-Networks. In this scheme, each node with message searches for possible path nodes to copy its message. Hence, possible path nodes of a node are considered. Using NSS, each node having message selects its path nodes to provide a sufficient level of end-to-end latency while examining its transmission effort. Here, it derives the CSS measure to permit CR-Networks nodes to decide which licensed channels should be used. The aim of CSS is to maximize spectrum utilization with minimum interference to primary system. Assume that there are M licensed channels with different bandwidth values and y denotes the bandwidth of channel c. Each CR-Networks node is also assumed to periodically sense a set of M licensed channels. Mi denotes the set including Ids of licensed channels that are periodically sensed by node i. Suppose that channel c is periodically sensed by node i in each slot and channel c is idle during the time interval x called channel idle duration. Here, it use the product of channel bandwidth y and the channel idle duration x, tc = xy, as a metric to examine the channel idleness. Furthermore, failures in the sensing of primary users are assumed to cause

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the collisions among the transmissions of primary users and CR-Networks nodes.

Tools used for implementation: NS2

IV. EXPECTED RESULT

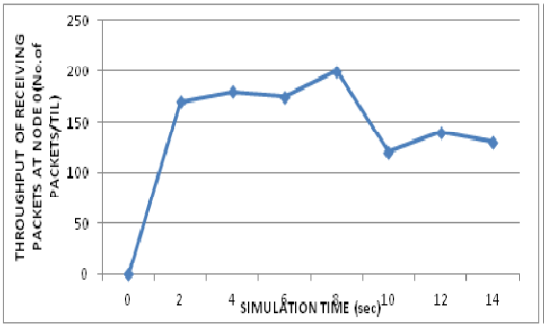

Fig. 1 Simulation time vs Throughput of receiving packets

In the fig 1, it shows the graph of time Vs throughput of receiving packet. Throughput is the average rate of successful message delivery over a communication channel.

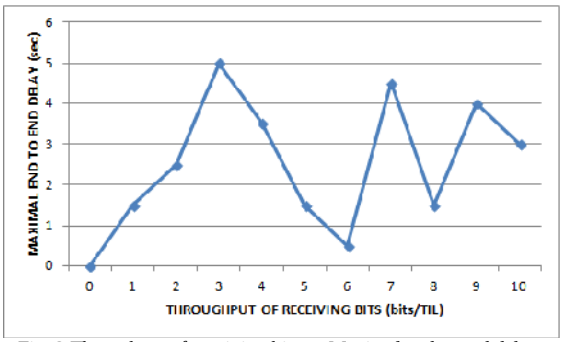

Fig. 2 Throughput of receiving bits vs Maximal end to end delay

In the fig 2, it shows the graph of throughput of received bits Vs Maximal end to end delay. End to end delay is the time taken by a packet to travel from source to reach destination.

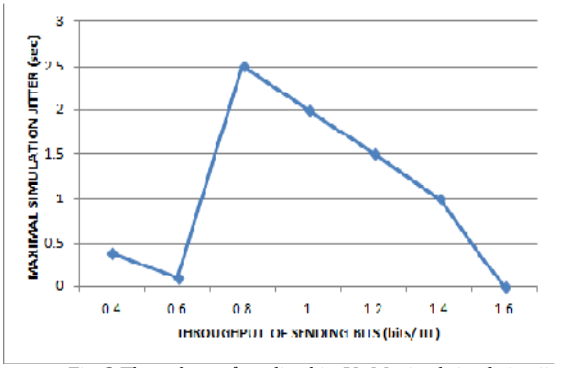

Fig .3 Throughput of sending bits Vs Maximal simulation jitter

In Fig 3, Throughput of sending bits Vs Maximal simulation jitter. Jitter is the undesired deviation from true periodicity of an assumed periodic signal. Jitter period is the interval between two times of maximum effect (or minimum effect) of a signal characteristic that varies regularly with time.

V. CONCLUSION

Thus it allows each node with message to decide whether to copy the message to a path node by optimizing its transmission effort in order to provide a sufficient level of message delay. Using a channel selection scheme provides spectrum utilization while it minimizes the interference level to primary system. Using trustworthy algorithm, it improves the trustworthiness of the Spectrum sensing in CR-Networks. It enables network nodes to adaptively regulate their communication strategies according to dynamically changing network environment.

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