PERFORMANCE ASSESSMENT OF SPECTRUM SHARING SYSTEMS WITH SERVICE DIFFERENTIATION

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Abstract:

Spectrum sharing systems have become popular due to the need for higher utilization of the available resources. It is necessary to study the problems caused due to inefficient usage of spectrum and find suitable alternatives to accommodate a higher number of users to spectrum, thus making it efficient in terms of money spent and power consumed[1]. This paper aims at studying the problems of spectrum under-utilization, performance, service priority, and performance assessment of potential scheduling approaches.

I. INTRODUCTION :

Cognitive Radio Networks and Spectrum sharing[2]*:*

To increase radio spectrum utility, cognitive radio network is considered a promising technology. In the approach of spectrum sharing, the Secondary Users (SU) access the licensed frequency bands that are allocated to the Primary Users(PUs) without having to violate the quality of Primary Users' (PU) transmission[3]. Spectrum sharing and spectrum sensing are vital for communication in cognitive radio networks[4]. But, when it comes to a hyper dense 5G mobile environment, spectrum sharing along with interference management, energy efficiency and multi-hop communications are substantial challenges that require further and deep

investigation [4]. Furthermore, guaranteeing an ideal spectrum sensing is challenging and there are risks of SUs causing interference to PUs in a probable case of missed-detection[3], [5].
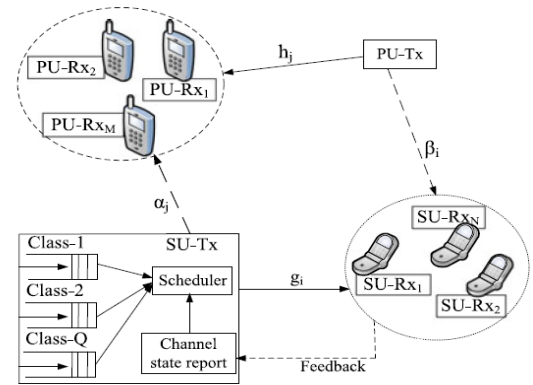

Fig 1: System model of an Underlay CRN[3]

II. SURVEY OF LITERATURE :

Quality of Service and Service Differentiation [3]*:*

Since Quality of Service (QoS) is of a prime importance in the design of wireless networks, several different applications demand divergent QoS. In this case, because of the constraints corresponding to interference imposed by the Primary User, providing QoS to CRN is more challenging. Hence, an efficient approach is to provide QoS to adopt service differentiation to diversified traffic classes[6]. Sibomana illustrates that it is indeed essential to investigate secondary

packet scheduling and transmission schemes using QoS based priority queuing[3].

In the systems under consideration for analysis, a PU could be a TV broadcast station etc and SU could be Customer Premises Equipments(CPEs)[1]. Emphasis is placed on service differentiation and how the performance is influenced, rather than the specific features of a system(s) that constitute the PUs and SUs.

III. CONCLUSION :

During this work, various aspects of spectrum sharing systems have been studied. Focus was placed on the performance analysis for different scheduling algorithms[7] in terms of spectrum utilization and delay.

The future work for this paper would be to extend this study to simulation, where performance of the spectrum sharing systems will be assessed for service differentiation and inferences or possible solutions to the problem of spectrum under utilization will be addressed.

IV. ACKNOWLEDGEMENT :

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