



REMOTE RADIO HEADS

A Spectrum Selection Mechanism for Centralised and Distributed Baseband Architectures.

Overview

Demand for LTE bandwidth is increasing and frequency bands are becoming more congested. The problem is addressed by enabling **spectrum sharing** and increasing **spectrum efficiency** through better spectrum management. This system enables a cellular operator to compute bandwidth from shared spectrum in a cellular network. It provides a mechanism for calculating the required spectrum resources a cellular operator needs to lease from a shared spectrum class to provide a minimum QoS to an end-user. As an input, the mechanism uses QoS metric based on the downlink rate of an average user. The objective is to determine the minimum spectrum requirement from the exclusively shared spectrum class to meet the average user target rate. The user rate is obtained by computing i) its SINR, ii) the normalised throughput and iii) the average amount of spectrum resources the user gets for each spectrum class. Furthermore, a design parameter (access probability threshold: based on the percentage of users able to connect to the commonly shared channel), determines whether the throughput from this spectrum class should be taken as an input into the decision-making process. Please refer to the diagrams below.

Advantages

Ensures balancing of QoS and cost through a spectrum selection mechanism, which minimises cost (of the spectrum), while at the same time provides the required QoS, quantified as average user throughput. It provides flexibility and scope in how the future, potential sharing bands (below and above 6 GHz) can be incorporated and mapped to the two spectrum classes (where one is free and one is fee paying).

Technology Status

Deployed on testbed

Applications

The invention could be deployed in a radio access network, controlling the allocation of different spectrum classes to a group of base stations, or it can be incorporated into an OSS system, performing the same task.

Market Opportunity

By adopting the selection mechanism, an operator would see an **average reduction of 30%** in the fee-paying exclusively shared spectrum that it would need to access.



Technology Sector
Telecommunications

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Opportunity
Research collaboration/Licensing

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