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Algorithm for Continuous Distributed Lexicographic Max-Min Resource Allocation

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Background

Currently, mobile wireless networks use contention-based protocols because of their simplicity and ability to adapt to changes in network conditions. Unfortunately, these systems lack the ability to prioritize the supply and demand load and changes in topology. This inability can cause variances in or delay of signals that can be important in applications that are heavily dependent on voice and video communications. Currently, defense and business applications are becoming more dependent on highly capable communication systems. There is a need for wireless network systems that are able to respond more quickly to the large amounts of data in video communications.

Invention Description

Researchers at Arizona State University have developed the first medium access control protocol for mobile wireless networks. This protocol is capable of adapting to changes in topology and load from supply and demand. The system is able to preform its other functions at levels comparable with contention-based protocols that are currently in service. The innovation can achieve similar delay and throughput but with much less variance on delay of signals, which can be important in applications that use voice and video communications. This system distributes resource allocation by auctioning the resources. As a part of the signal header there is a packet, which makes a bid for a channel. Based on all available bids, the channel allocation is selected. This innovation allows the network to choose which programs to allocate the resources based on the program needs and best use of the resources.

Potential Applications

- Defense communications
- Business systems
- Entertainment

Benefits and Advantages

- **More Power** – Eliminates signal delays, improving reliability
- **Retrofit** – Can upgrade existing wireless networks
- **Lower Costs** – No additional hardware required