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Dynamic Resource Partitioning between Massive Broadband and Machine Type Communication in 5G Networks

Machine Type Communication (MTC) traffic generated by the Internet of Things (IoT) will play an important role in 5G networks. Besides that, traditional Massive Broadband (MBB) traffic will also increase in the future. Therefore, 5G networks have to support both traffic types by providing appropriate media access schemes. For MBB, scheduled access is the candidate of choice. In contrast, for MTC traffic it is desirable to reduce the signaling overhead to achieve shortest possible latencies as well as to reduce the energy consumption of IoT devices. Both goals can be achieved by utilizing media access schemes based on Random Access (RA). As MBB and MTC traffic both depend on the same radio resources, a resource partitioning is necessary to avoid collisions between both traffic types. In this paper we propose a dynamic partitioning scheme that utilizes a control loop to manage the amount of reserved radio resources for MTC traffic. The control loop measures the average collision probability of the RA based MTC traffic and estimates the MTC traffic load. This estimate is then used to control the amount of reserved radio resources. The performance of the control loop is evaluated using constant as well as variable MTC traffic load.

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