Researchers at the University of South Florida have created a medium access control (MAC) protocol for Internet of Things (IoT) networks that significantly improves the throughput and reduces the channel access delay compared to conventional access protocols.

The rapid growth of both the number of connected devices and the data volume that is expected to be associated with IoT applications, has increased the popularity of Machine-to-Machine (M2M) type communication within 5G wireless communication systems. Existing protocols are not scalable and cannot provide sufficient throughput to meet the demands for a massive number of IoT devices. Hence, it is necessary to rethink the medium access control (MAC) protocol to match the massive amount of devices accessing the shared medium and low complexity requirements of IoT devices.

Inventors at USF have developed a Beamforming Slotted Aloha Non-Orthogonal Multiple Access (BF-SA-NOMA) random access protocol that is easy to implement, scalable and has low complexity requirements matched to the capabilities of IoT devices. The protocol uses multiple hypothesis testing to determine the number of active IoT devices in the medium. Compared to conventional protocols there is a significant improvement in throughput for a large number of IoT devices. The protocol also addresses channel access delay problem by reducing the probability of collision and consequently lowering the average back-off delay via beamforming.

Advantages:
- Scalable
- Energy efficient
- Higher throughput
- Lower channel access delay

BF-SAN Protocol Phases

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