Quantitative Methods and Simulations

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What are the differences between Aloha and Slotted Aloha? To begin, lets discus the definition of Aloha. Aloha is a random-access protocol, used for data transmission. Aloha works by transmitting data between stations at arbitrary time intervals, with some downsides. One of which was data collision. When data collided because it was transmitted in the same channel and at the same time, the data was destroyed. When the data packets were sent, the sender waited a determined amount of time and if did not get a success response it would send the packet again. While this random-access protocol was pioneering at the time, it was very inefficient, with a 18.4% success rate.

Now, this is where Slotted Aloha comes in. It solves some of the problems presented in pure Aloha and these same improvements are what make it more advantageous to use Slotted Aloha instead of pure Aloha. To begin, Slotted Aloha works with time slots, meaning there are “blocks” of time. Data packets are sent at the beginning of each block and if there is no successful response, the station waits until the next time slot to send the packet again. This reduces data collisions and by default, data loss. These changes make it so Slotted Aloha has a much higher success rate, at 50% with a 50% usage of channels.