IEEE 802.11 Analysis System

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Introduction

The original goal of this project was to develop a Wi-Fi troubleshooting system focused on analyzing throughput and density from a trace file. However, evolved into a comprehensive 802.11 packet analysis software. The system performs parsing and statistical evaluation of Wi-Fi frames by capturing detailed metrics related to wifi throughput between two devices, or overall Wi-Fi channel density. This allows for deeper insights into the performance and reliability of Wi-Fi networks, making it valuable for performance profiling, and analysis into wireless behavior under varying conditions.

The system uses an Electron and React-based frontend with a Python backend. These two components communicate with each other via subprocess messaging. The backend is responsible for parsing and analyzing trace files and returns structured data objects for the frontend to display. When analyzing a trace file, the system provides two distinct modes: network density analysis or throughput analysis between two sources. Each mode produces a different type of report tailored to its purpose with the former focused on overall network activity and congestion, and the latter on link-specific performance between a sender and receiver.