**Probr – A Generic and Passive WiFi Tracking System**

### Design Goals
- **Support for Commodity Sniffing Devices**
  - Any device that supports UNIX and promiscuous WiFi can be used for sniffing
- **Web Based Device and Tracking Administration**
  - Remotely set up sniffing devices and start collecting 802.11 probe requests
- **Real-Time Analysis**
  - Real-time analysis using MapReduce and Web-based exploration and visualization
- **Extendible Architecture**
  - Attach custom analysis tools such as R, Matlab to Probr-Core for your own research

### Probr-Core
- Remote command execution on sniffing devices with predefined sniffing command templates
- Extracts packets from collected PCAP files and stores them to central storage
- Multiple adapters for different storage solutions (MongoDB, PostgreSQL, Redis, Kafka etc.)

### Probr-Analysis
- Live display of current packets
- Interactive visualization of analysis results
- Query and filter collected packets by timestamp, MAC address etc.
- Worker-based asynchronous analysis and computation
- Location-heatmap of monitored devices

### Session Tracking
- Groups packets into session windows based on MAC address presence
- Separates session windows by gaps of inactivity
- Discards sessions shorter than predefined threshold to reduce noise
- Aggregates concurrent sessions over time
- Serves as a basis for room utilization

### Device Localization
- Computes locations of monitored devices based on the Received Signal Strength Indicator (RSSI)

### Room Utilization
- Estimates utilization of a monitored area or room by utilizing concurrent session count at any given time

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