Wireless Troubleshooting

TEK5110- Building Mobile and Wireless Networks
Department of Technology Systems
University of Oslo

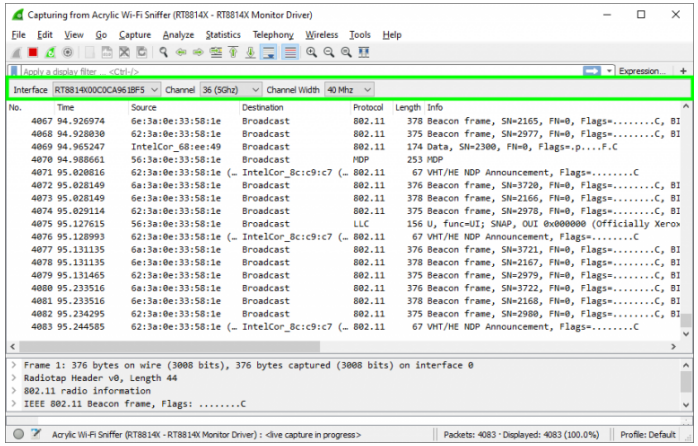
Maghsoud Morshedi, Josef Noll

Why do we need troubleshooting?

- Wi-Fi networks operate on unlicensed frequency bands, so the medium is changing constantly
- Interference
- Poor design of Wi-Fi networks
- Client incompatibility/software issues
- AP misconfiguration

Wireless troubleshooting tools

- Protocol analyzer
  - Wireshark, TamoSoft's comm view



- Spectrum analyzer
  - MetaGeek's Wi-Spy

Protocol analyzer troubleshooting

- Retransmission
  - Retransmission should be Less than 10%
- Interference
  - Causes high levels of retransmissions
- Low SNR
  - SNR of 25 dB or greater is considered good quality while SNR of 10 dB or lower considered poor quality
- Hidden nodes
  - Mobile devices usually become hidden nodes when they move around, and obstruction hinders their signal to be heard by all associated stations
  - RTS/CTS can be used to avoid hidden nodes
- Power mismatch between AP and stations
- Authentication problem
- Channel utilization
  - Some APs provide channel utilization in their beacon advertisement

Wi-Fi packet capture equipment

- USB network adapter
  - Mediatek MT7612u, Realtek RTL8822bu
- Raspberry Pi
- Script capturing Wi-Fi frames on the desired channel
- Wireshark to analyze frames

Demo 1: Capture Wi-Fi frames

https://download.schneider-electric.com/files?p_enDocType=User+guide&p_File_Name=DOCA0157EN-06.pdf&p_Doc_Ref=DOCA0157EN

Demo 2: Capture Wi-Fi beacons

Demo 3: Analyze Wi-Fi retransmission

Demo 4: Analyze Wi-Fi signal strength


Q&A