On Coexistence of LTE-U and Wi-Fi

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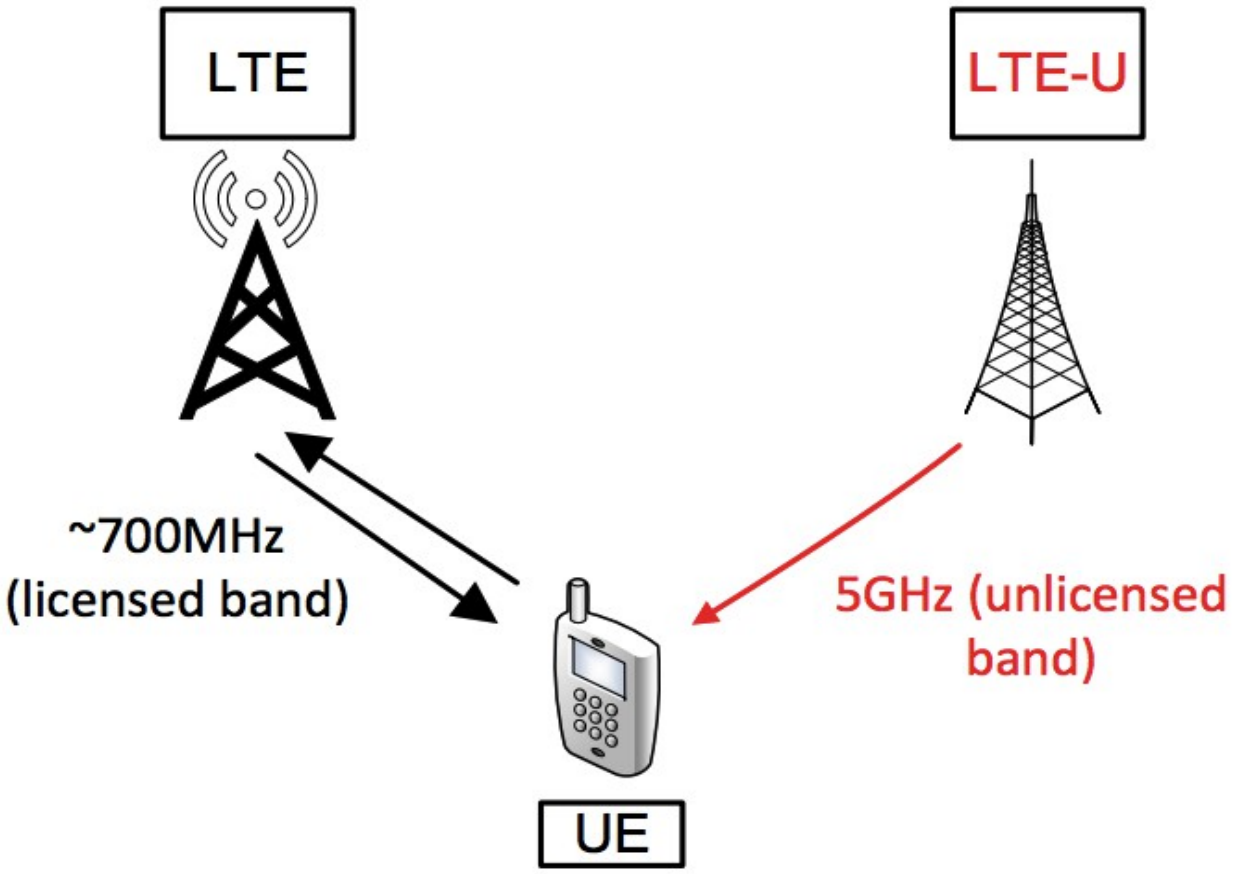
Wi-Fi vs. LTE

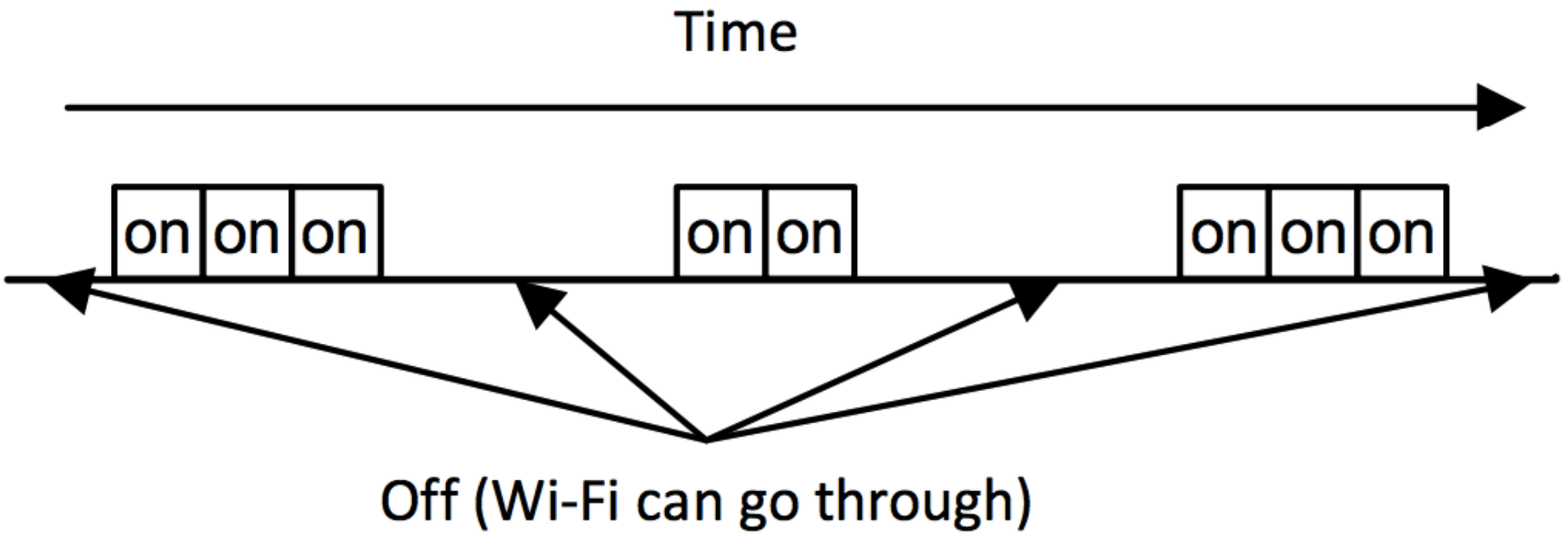
- Wi-Fi
  - Unlicensed band sharing with other wireless technologies, e.g., bluetooth, xbox controller etc.
  - Listen-before-talk for coexistence
- LTE
  - Licensed band for exclusive usage
  - Transmitting all the time

What is LTE-U?



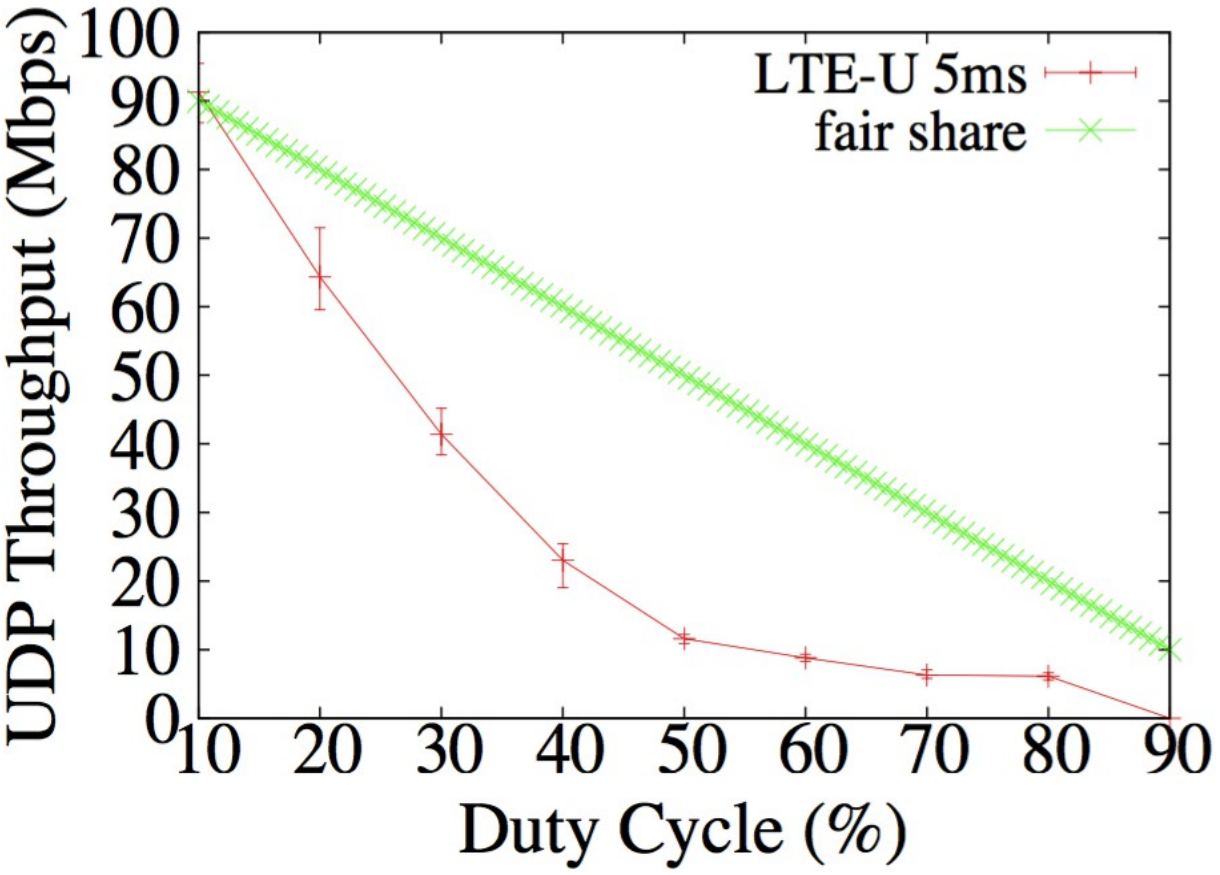
- LTE-U: Control channel in licensed band and supplemental downlink data channel in unlicensed band (5GHz)

Current Coexistence Mechanism



- Use on/off patterns (or duty cycling) to share with Wi-Fi
- Use CSAT algorithm to adjust on time based on Wi-Fi Medium Utilization to achieve fair share

Is Duty-cycling Effective?



- Received LTE-U power at Wi-Fi AP and client: -70dBm

Other Questions

- What are the impacts of LTE-U to Wi-Fi in various power settings?
- What are the impacts of LTE-U to different Wi-Fi routers?
- What mechanism can be used to achieve fair sharing between LTE-U and Wi-Fi?
- Is Medium Utilization a good metric to measure Wi-Fi usage?

Please read our report (available soon)

Thanks

Q&A

Is Duty-cycling Effective?

- Google: No
  - Wi-Fi rate adaptation fails, especially when Wi-Fi cannot detect LTE-U (below -62dBm)
- Qualcomm: Yes
  - LTE-U is a better neighbor than Wi-Fi itself when Wi-Fi can detect LTE-U