Wi-Fi 7 PHY/MAC technology deep-dive with traces

Schedule : 9.30 am to 4.30 PM

Training Partner: Alethea Communications Technology Pvt. Ltd.

- Main objectives of Wi-Fi 7
    - Peak rate enhancements
    - Better use of 6 GHz
    - High-rate requirements to compete with 5G and beyond
    - Timelines envisaged for completion of standards
- Multi-link operation
        - Motivation and general points
        - Multi-link discovery
            - Discovery procedures and RNR
            - ML element structure
            - Beacon frames and legacy probe response frame
            - Usage and rules of ML information element in the context of discovery
            - MLO probe request and probe response frames
            - MLD_ID, Link_ID, MLD_address, link address in frames
        - Multi-link setup
            - Procedure
            - Important new parts of Association request
            - MLO association
            - Security
            - Derivation of PMK and PTK
            - Practical 4-way handshake analysis
            - Managing WPA3 and WPA2 with WiFi 7 deployments
        - MLO data frames
            - Capturing MLO data frames on multiple links
            - Use of real-life capture setup
            - Use of link _addresses in wireless frames
            - Use of MLD_addresses on the backend
            - DL and UL data frames using multiple links
            - Sharing of SN space
        - TID-to-link mapping and link management
        - Power save in MLO using traces
        - Multi-link channel access
            - STR and Non-STR
            - Capability signaling
        - Enhanced multi-link operation mode (EMLSR)
            - Traces of EMLSR association

        - EML notification frame
        - Initial control frame operation
    - Multi-BSSID operation
        - Observing RNR, MLD_IDs and other information
    - WFA features for WiFi 7
    - MLO performance testbed

- PHY/RF enhancements
    - Large bandwidth channels
    - Preamble puncturing examples with traces
        - Different puncturing patterns and their signaling
        - Channel switch fields and their relevance for managing legacy
        - Use of traces to illustrate preamble puncturing signaling
        - Throughput impacts of preamble puncturing on legacy and 11be STAs
    - EHT Preamble ; backward and forward compatibility
    - PPDU format for SU and MU transmissions
    - Updates to modulation, coding, MIMO, MU-MIMO, beamforming
    - Other topics
- Summary