Licensed Assisted Access (LAA)

Exponentially rising data traffic, scarcity of spectrum, and expectations of enhanced user experience are leading operators to explore the use of unlicensed spectrum to carry traffic. 3GPP has defined specific approaches for using the unlicensed spectrum. In one approach, some or all of the traffic is carried by the Wi-Fi network in the unlicensed spectrum. Example mechanisms include Wi-Fi offload and LTE-Wi-Fi Link Aggregation (LWA). In another approach, the traffic is carried by LTE and its evolutionary technologies (e.g., LTE-Advanced) simultaneously on licensed and unlicensed spectrums. Example mechanisms include Licensed Assisted Access (LAA), LTE-Unlicensed (LTE-U), and enhanced LAA (eLAA). This course provides an overview of these mechanisms, a closer look at their key components, and operational similarities and differences between LTE and LAA.

Intended Audience

A high-level technical overview to personnel involved in product management, marketing, planning, design, engineering, and operations.

Objectives

After completing this course, the student will be able to:

- Explain the motivation behind the use of unlicensed spectrum
- Distinguish among Wi-Fi offload, LWA, LTE-U, LAA, and eLAA
- List benefits of using LTE in unlicensed spectrum instead of Wi-Fi
- Identify key technology components for LAA, LTE-U, and eLAA
- Describe mechanisms used by LAA to share the unlicensed spectrum with Wi-Fi networks
- Summarize how downlink data transfer occurs in LAA
- Summarize required changes in the UE and the network to support LAA

What You Can Expect

- Expert-Led Live Duration: 4 HOUR
- Prerequisite: LTE Overview

Outline

1. **LTE in Unlicensed Spectrum**
   1.1 Motivation for unlicensed spectrum
   1.2 Evolution of unlicensed LTE
   1.3 LTE-Wi-Fi interworking
   1.4 Wi-Fi offload
   1.5 LWA
   1.6 Carrier aggregation with unlicensed spectrum
   1.7 LTE-U
   1.8 LAA and eLAA

2. **Key Technology Components**
   2.1 LTE vs. Wi-Fi
   2.2 Unlicensed spectrum: bands and FCC regulations
   2.3 Small Cells
   2.4 Carrier aggregation
   2.5 Spectrum-sharing mechanisms
   2.6 Dynamic channel selection
   2.7 CSAT
   2.8 Opportunistic SDL
   2.9 Listen before Talk (LBT)
   2.10 Channel access priority classes
   2.11 Hidden node discovery
   2.12 Discovery Reference Signals

3. **LAA Operations**
   3.1 Bearer setup
   3.2 UE capability exchange
   3.3 SCell configuration and activation
   3.4 DL data transfer
   3.5 UE and network changes for LAA

Award Solutions