

802.11 and Community WiFi Technical Overview

Outline

WiFi is a fundamental home and enterprise network component. Through new generations of Hotspots and new business models, Community WiFi is now extending further, in particular to offload 4G networks.

This 3 hour workshop outlines WiFi architecture, radio interfaces, protocols and how developments in Community WiFi are underpinning current deployments.

The course begins with an overview of 802.11 standards developments and the WiFi Alliance. The 802.11 architecture, key protocols and frame types are outlined, along with addressing mechanisms and managements operations. 802.11n and 802.11ac radio interfaces are then considered, along with emerging 60 GHz band WiGig technologies.

WiFi security techniques are then reviewed, followed by an overview of WiFi Direct and Miracast services. Community WiFi mechanisms are then examined, in particular Next Generation Hotspots (NGH) and the WiFi Alliance Passport mechanisms. The workshop concludes with an overview of current public WiFi deployments and associated business models

Course Objectives

Those completing this course should be able to:

- Describe the 802.11 standards and the WiFi Alliance role
- Outline the 802.11 architecture, key protocols and addressing mechanisms
- Describe the 802.11n and 802.11ac wireless interface capabilities
- List the key WiFi managements operations, and describe how they work
- Understand the WiFi security architecture, and how it operates in home and enterprise networks
- Outline current WiFi Alliance developments: WiFi Direct and Mirapoint
- Describe how WiFi Passport, Hotspot 2,0 and the 3GPP ANDSF framework support Community WiFi services
- Describe the WiFi Hotspot market place, and current WiFi rollouts and business models

About the Instructor

Dr Evers, a graduate of Yale University and the University of Wollongong, has a commercial background stretching over two decades in the telecommunications industry. Training clients include Telstra, Vicom, Broadcast Australia, NSW, SA and WA Govts, as well as Australian Government agencies, including the ACMA, Australian Crime Commission and the AFP.

Course Outline

802.11 and WiFi Overview

802.11 and WiFi standards	802.11 standards development. The WiFi Alliance.
Architecture , Protocols and Management	Access Points. MAC protocols. 802.11 addressing. SSID, BSSID. Beacon frames. Scanning, Association procedures.
802.11 Radio Interface	2.4GHz and 5 GHz channels. 802.11n/ac: MIMO, wider channels, beamforming. WiGig: 802.11ad and 60GHz band services

Break

Security and Community WiFi

Security	WEP, WPA, WPA2. 802.11i. Encryption: CCMP. Authentication, Key Management. Known attacks.
WiFi developments	WiFi Direct: P2P services WiFi Miracast: video display.
Community WiFi	Wireless Broadband Alliance: Next Generation Hotspot (NGH). WiFi Passpoint and Hotspot 2.0.
WiFi Deployment and Roaming	Hotspot providers. Telstra WiFi rollout and the FON business model. Mobile offload mechanisms. The 3GPP ANDSF framework