Systems & Network Training

Cellular integration with WiFi

A 2 day training course

Save on expenses. This course is also available on your premises.

Description

This course is designed to give the delegate a foundation in IEEE 802.11ax deployments (WiFi 6, 6e and 7) which are a high efficiency release and multi-user environment. Using OFDMA and Resource Units the technology can support multiple users at the same time by allocating resources in advance. We will investigate the requirements to allow multi-user in what has historically been a one at a time technology. Starting with a brief overview of WLAN in general we will identify the necessary changes to existing frame structures and other measurement procedures to allow for multi-user deployment and future deployment and integration with the 3GPP 5G core network environment.

Key outcomes

By the end of the course delegates will be able to:

- Explain the basic WLAN procedures such as NAV Timers and Back-Off Timers
- Describe the basic deployment of OFDMA technology
- Explain the Data Frames, Management Frames and Control Frames required for WiFi 6
- Explain the basic concepts of MU-MIMO
- Explain BSS Colour & Spatial Reuse

Training approach

This structured course uses Instructor Led Training to provide the best possible learning experience. Small class sizes ensure students benefit from our engaging and interactive style of teaching with delegates encouraged to ask questions throughout the course. Quizzes follow each major section allowing checking of learning.

Details

Who will benefit?
Those who work in networking and telecommunications

Prerequisites
Essential 5G

Duration: 2 days

Customer rating: New course

Generic training	Small class sizes	Hands On training	Our courseware	Customise your course
Generic training complements product specific courses covering the complete picture of all relevant devices including the protocols “on the wire”.	We limit our maximum class size to 8 delegates; often we have less than this. This ensures optimal interactivity between delegates and instructor.	The majority of our courses use hands on sessions to reinforce the theory.	We write our own courses; courseware does not just consist of slides and our slides are diagrams not bullet point text.	Please contact us if you would like a course to be customised to meet your specific requirements. Have the course your way.
“*Friendly environment with expert teaching that teaches the why before the how.*” G.C. Fasthosts	*“Excellent course. The small class size was a great benefit...”* M.B. IBM	*“Not many courses have practice added to it. Normally just the theoretical stuff is covered.”* J.W. Vodafone	*“Comprehensive materials that made the course easy to follow and will be used as a reference point.”* V.B. Rockwell Collins	*“I was very impressed by the combination of practical and theory. Very informative. Friendly approachable environment, lots of hands on.”* S.R. Qinetiq

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Course content

802.11 medium access
- Distributed Coordination Function (DCF)
- Physical Carrier Sense
- Virtual Carrier Sense
- Pseudo-Random backoff timer
- Interframe spacing
- Hybrid Coordination Function (HCF)
- Enhanced Distributed Channel Access (EDCA)
- HCF Controlled Channel Access (HCCA)

802.11 MAC
- MAA header
- Frame control field
- Duration/ID field
- MAC layer addressing
- Sequence control field
- QoS control field
- HT control field
- 802.11 frame body
- Management frames
- Control frames
- Data frames
- Power management

802.11ax: High Efficiency (HE)
- 802.11ax = WiFi6
- WiFi Traffic congestion
- HE overview
- Multi-user (MU)
- OFDMA
- Subcarriers
- Resource units
- Trigger frames
- Downlink OFDMA
- Uplink OFDMA
- Buffer status reports
- Operating mode indication
- MU-MIMO
- BSS colour & spatial reuse
- OBSS
- BSS colour
- Spatial reuse operation
- Target wake time
- Additional 802.11ax PHY & MAC capabilities
- 1024 QAM
- Long symbol time guard intervals
- 802.11ax PHY headers
- Multi-TID AMPDU
- WiFi certified 6
- WiFi 6E channelisation

An introduction to WiFi 7
- Key Features of WiFi 7
- 320 MHz channels
- 4K QAM
- Multi-Link operation and deterministic latency
- Multi-Resource Units (RU) and puncturing

What our customers say

"Absolutely brilliant, very knowledgeable and helpful trainer would recommend to teach anyone. Kept me interested 100% of the time which is very impressive as this does not happen often, if at all!"

O. B. Network Rail

"The best technical course I've been on!."

L. W. Fujitsu Telecoms Europe

"Very well thought out and structured course. Would recommend 100%. Lots of equipment, good quality."

A.R. Unipart

"Course content is interesting. Relevant to current systems and presented well."

S.S-T. Arqiva