KOENIG SOLUTIONS · COURSE OUTLINE

Wireless Connectivity: Secure Practices and Troubleshooting

Learn to secure, analyse and troubleshoot wireless networks, from RF fundamentals to encryption, authentication and WLAN issue resolution.

8	32
MODULES	TOPICS

COURSE OVERVIEW

This course covers the foundations of wireless networking, including the electromagnetic spectrum, modulation and signal propagation, followed by RF behaviour, multipath effects and antenna characteristics. It then addresses securing wireless networks through threat analysis, rogue access point detection, encryption protocols such as WPA3 and WEP, and strong authentication methods including EAP-TLS, RADIUS and 802.1X. Further modules examine RF signal measurement and spectrum analysis, 802.11 frame types, and WLAN security mechanisms such as AAA integration and captive portal authentication. The course concludes with WLAN troubleshooting methodology, client connectivity issues and the tools and logs used to diagnose them.

WHO THIS COURSE IS FOR

- **Network Engineers**
- **Wireless Engineers**
- **Network Security Administrators**
- **IT Support Technicians**
- **Network Administrators**

LEARNING OBJECTIVES

- Explain the evolution and fundamentals of wireless communication
- Describe RF behaviour, multipath propagation and antenna characteristics
- Identify wireless threats and rogue access points
- Apply encryption protocols such as WPA3, WEP and AES
- Configure strong authentication using EAP-TLS and 802.1X
- Analyse RF signals using spectrum analysis and SNR measurements
- Interpret 802.11 frame types including beacon and deauthentication frames
- Troubleshoot WLAN client connectivity using diagnostic tools and logs

COURSE SYLLABUS

8 Modules, 32 Topics

01

Foundations of Wireless Networking

TOPICS

Evolution of Wireless Communication · Electromagnetic Spectrum and Frequency Bands · Modulation Techniques and Applications · Signal Propagation and Path Loss

02

RF Fundamentals and Behavior

TOPICS

RF Behavior and Characteristics · Multipath Propagation Effects · Antennas and RF Mathematics · Antenna Polarization Diversity

03

Securing Wireless Networks

TOPICS

Wireless Threat Analysis · Rogue AP Detection and Mitigation · **Encryption Protocols:** WPA/WPA2, WEP, WPA3 · Strong Authentication: EAP-TLS

04

Robust Wireless Security Strategies

TOPICS

Encryption Algorithms: AES, TKIP · WPA3 Enhancements and Benefits · RADIUS Server and 802.1X Authentication · Comprehensive Wireless Security Policy

05

RF Signal Measurements and Analysis

TOPICS

RF Signal Measurements and Spectrum Analysis · Signal-to-Noise Ratio (SNR) Measurements · Channel Utilization Analysis · Identifying and Locating Interference

06

WLAN Frame Types and Concepts

TOPICS

802.11 Frame Types · Beacon, Probe, Authentication Frames · Deauthentication and Disassociation Frames · QoS Data and Management Frames

07

WLAN Security and Authentication

TOPICS

WLAN Security and Authentication · **AAA Server Integration:** RADIUS, TACACS+ · Captive Portal Authentication · Guest Network Provisioning

08

WLAN Troubleshooting and Management

TOPICS

WLAN Troubleshooting Methodology · Identifying and Isolating Issues · Troubleshooting Client Connectivity · Troubleshooting Tools and Logs

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

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