Wireless –9hrs

Higher Certificate in Wireless LAN Specialist

課程簡介

隨著無線技術的突飛猛進，現今的無線技術已包括：無線電話 (2.5G/3G)、微波傳送、紅外線傳送、藍芽及無線網絡 (Wireless LAN)。

無線網絡技術由最初的 802.11b，演化至現在的 802.11g，速度已經由 11Mbps 提升至 54Mbps，效能上亦可媲美傳統的 Ethernet。正因如此，在可見的未來，無線網絡技術將會大行其道。無線網絡技術特別適合一些不方便鋪設線路的地方使用，如：戶外接駁或具歷史價值的樓宇等。作爲一個網絡工程人員，無線網絡技術實在是必須掌握的新一代連線技巧。

課程目標

本課程針對一般 IT 人士而設，課程將教授無線電波常識 (Radio Frequency)、802.11a/b/g 的應用、無線網絡保安技巧及無線網絡設計技巧等。修畢學員除可學懂項以上的基本知識外，更可考取以下專業資格：

- ✧ CWNA – Certified Wireless Network Associatie

課程內容

Introduction to 802.11 WLANs

- ✧ Discuss the standards organizations responsible for shaping the 802.11 Wireless LAN protocol
- ✧ Learn how standards compliance is enforced for 802.11 WLAN vendors
- ✧ Examine the 802.11 standard and various amendments
- ✧ Discuss additional networking standards that are commonly used to enhance 802.11 WLANs

RF Power Output Regulations

- ✧ Understand international, regional, and local RF spectrum management organizations
- ✧ Understand RF channels in the unlicensed 2.4 GHz and 5 GHz frequency ranges
- ✧ How power output limitations are enforced by the FCC for Point-to-Multipoint (PtMP) and Point-to-Point (PtP) wireless connections

802.11 Analysis and Troubleshooting

- ✧ Introduction to 802.11 Protocol Analysis
- ✧ 802.11 Data Frames
- ✧ 802.11 Control Frames
- ✧ 802.11 Management Frames
- ✧ Frame Fragmentation
- ✧ Power Saving operations
- ✧ Transmission Rates

Radio Frequency Fundamentals

- ✧ Physical aspects of RF propagation
- ✧ Types of losses and attenuation that affect RF communications
- ✧ Types of modulation used for wireless communications
- ✧ How channels and bandwidth are related to each other in wireless networks
- ✧ Three types of Spread Spectrum used in wireless networking

Power over Ethernet

- ✧ Recognize the two types of devices used in Power over Ethernet (PoE)
- ✧ Recognize the differences between the two types of Power Sourcing Equipment (PSE)
- ✧ Understand the two ways in which power can be delivered using PoE
- ✧ Understand the importance of planning to maximize the efficiency of Power over Ethernet

Coordinating 802.11 Frame Transmissions

- ✧ Differences between CSMA/CD and CSMA/CA
- ✧ Distributed Coordination Function (DCF)
- ✧ Quality of Service in 802.11 WLANS

Antennas

- ✧ Antenna characteristics and behaviors
- ✧ Types of antennas commonly used with WLANs
- ✧ Advanced antenna systems
- ✧ Antenna placement and mounting
- ✧ Antenna safety
- ✧ Types of antenna cables, connectors, and accessories

RF Math and System Operating Margin

- RF units of measure
- Basic RF mathematics
- RF signal measurements
- Understand link budgets
- Define and calculate System Operating Margin (SOM)

802.11 Service Sets

- Explain three types of service sets defined for use within 802.11 WLANs
- Roaming within a WLAN
- Load-balancing as a method to improve congestion in WLANs

Wireless LAN Operation

- Ad Hoc networks
- Infrastructure networks
- Bridged networks
- Repeater networks
- Mesh networks
- WLAN switched networks
- Enterprise Wireless Gateway networks
- Enterprise Encryption Gateway networks
- Virtual AP networks
- Evolution of WLAN architectures
- WLAN Management

WLAN Security

- Security Policy and Procedures
- Legacy 802.11 Security Components
- 802.11i Security Components
- WPA-Personal
- WPA-Enterprise
- WPA2-Personal
- WPA2-Enterprise
- Baseline Security Practices (SOHO, SMB, Enterprise)

Site Surveying

- Understanding the need for a site survey
- Defining business requirements and justification
- Facility analysis
- Interviewing network management and users
- Identifying bandwidth requirements
- Determining contours of RF coverage
- Documenting installation problems
- Locating interference
- Reporting methodology and procedures
- Understanding specifics of each vertical market
- Understanding the customer's network topology
- Creating appropriate documentation during and after the site survey
- Understanding safety hazards
- Using appropriate hardware and software to perform the survey
- Understanding the need for spectrum analysis
- Manual RF site surveys
- Predictive site surveys
- Dense AP deployment