

KOENIG SOLUTIONS • COURSE OUTLINE

M98366A - Microsoft Networking Foundations

Learn to build a foundation in Microsoft networking, covering the OSI model, LAN devices, wireless networks, TCP/IP, and IPv4 addressing and troubleshooting.

3 Days

DURATION

8

MODULES

94

TOPICS

COURSE OVERVIEW

This series of courses provides an appropriate entry point to a future career in technology and assumes some hands-on experience or training but does not assume on-the-job experience. The course focuses on Microsoft Network Foundations

WHO THIS COURSE IS FOR

Network Technicians

IT Support Staff

Help Desk Technicians

Network Administrators

Aspiring Network Engineers

LEARNING OBJECTIVES

- Describe the seven layers of the OSI model
- Identify common local area networking devices and their functions
- Compare wireless standards such as 802.11n, ac and ax
- Explain wireless encryption standards including WPA and WPA2
- Explain data encapsulation and decapsulation within TCP/IP
- Apply classful and classless IPv4 subnetting schemes
- Configure IPv4 addressing including public, private and NAT settings
- Troubleshoot common IPv4 issues such as DNS and routing failures

8 Modules, 94 Topics

01

The OSI Model

OSI MODEL

Layer 1 - Physical · Layer 2 - Data link · Layer 3 - Network · Layer 4 - Transport · Layer 5 - Session · Layer 6 - Presentation · Layer 7 - Application

02

Local Area Networking

NETWORKING DEVICES

- Layer 2 switch
- Layer 3 capable switch
- Router
- Hub
- Access point
- Bridge
- Wireless LAN controller
- Load balancer
- Proxy server
- Cable modem
- DSL modem
- Repeater
- Voice gateway
- Media converter
- Intrusion prevention system (IPS)/intrusion detection system (IDS) device
- Firewall
- VPN headend

03

Implementing Wireless Networks

802.11 STANDARDS

- a
- b
- g
- n (WiFi 4)
- ac (WiFi 5)
- ax (WiFi 6)

FREQUENCIES AND RANGE

- 2.4GHz
- 5GHz

CHANNELS

- Regulatory impacts
- Channel bonding

SERVICE SET IDENTIFIER (SSID)

- Basic service set
- Extended service set
- Independent basic service set (Ad-hoc)
- Roaming

ANTENNA TYPES

- Omni
- Directional

Implementing Wireless Networks (continued)

ENCRYPTION STANDARDS

- WiFi Protected Access (WPA)/WPA2 Personal [Advanced Encryption Standard (AES)/Temporal Key Integrity Protocol (TKIP)]
- WPA/WPA2 Enterprise (AES/TKIP)

CELLULAR TECHNOLOGIES

- Code-division multiple access (CDMA)
- Global System for Mobile Communications (GSM)
- Long-Term Evolution (LTE)
- 3G, 4G, 5G
- Multiple input, multiple output (MIMO) and multi-user MIMO (MU-MIMO)

04

Overview of TCP/IP

DATA ENCAPSULATION AND DECAPSULATION WITHIN THE OSI MODEL CONTEXT

- | | |
|--|-----------------------------------|
| ■ Ethernet header | ■ TCP flags |
| ■ Internet Protocol (IP) header | ■ Payload |
| ■ Transmission Control Protocol (TCP)/User Datagram Protocol (UDP) headers | ■ Maximum transmission unit (MTU) |

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Implementing an IPv4 Addressing Scheme

IPv4 SUBNETTING

- | | |
|---|--|
| ■ Classless (variable-length subnet mask) | ■ C |
| ■ Classful | ■ D |
| ■ A | ■ E |
| ■ B | ■ Classless Inter-Domain Routing (CIDR) notation |

06

Configuring IPv4

PUBLIC VS. PRIVATE

- RFC1918
- Network address translation (NAT)
- Port address translation (PAT)

IPv4 VS. IPv6

- | | |
|---|-------------------|
| ■ Automatic Private IP Addressing (APIPA) | ■ Broadcast |
| ■ Extended unique identifier (EUI-64) | ■ Link local |
| ■ Multicast | ■ Loopback |
| ■ Unicast | ■ Default gateway |
| ■ Anycast | |

07

Troubleshooting IPv4

TOPICS

- | | |
|--|------------------------------|
| ■ Missing route | ■ Incorrect VLAN |
| ■ Low optical link budget | ■ DNS issues |
| ■ Certificate issues | ■ NTP issues |
| ■ Hardware failure | ■ BYOD challenges |
| ■ Host-based/network-based firewall settings | ■ Licensed feature issues |
| ■ Blocked services, ports, or addresses | ■ Network performance issues |

08

Implementing Remote Access

IDENTIFY THE PROBLEM

Gather information · Question users · Identify symptoms · Determine if anything has changed · Duplicate the problem, if possible · Approach multiple problems individually

ESTABLISH A THEORY OF PROBABLE CAUSE

Question the obvious · Consider multiple approaches · Top-to-bottom/

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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Live Online Classes (ILO)

Fly-Me-A-Trainer (FMAT)

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