

Networking Essentials: TCP/IP, DNS & Active Directory

Learn to build core networking skills across TCP/IP, DNS, Windows tools and Active Directory, and troubleshoot common issues.

10

MODULES

107

TOPICS

COURSE OVERVIEW

This course covers network fundamentals, including the OSI and TCP/IP models, addressing and routing, and the elements that make up a network such as switches, routers and network operating systems. It then examines TCP/IP addressing in detail, covering IPv4 and IPv6, subnetting, CIDR and transport protocols, before moving into commonly used IP network protocols such as DHCP, NAT, PAT, DNS, TELNET and FTP. It also covers Windows networking tools, Control Panel settings including firewall configuration, hands-on exercises with user accounts, shared folders and printers, and Active Directory concepts such as domains, forests, users, groups, organisational units and group policy. The course concludes with troubleshooting approaches for network, connectivity, name resolution, DHCP, boot and Group Policy issues.

WHO THIS COURSE IS FOR

Network Administrators

IT Support Technicians

System Administrators

Help Desk Engineers

Active Directory Administrators

LEARNING OBJECTIVES

- Describe the OSI and TCP/IP models and network addressing basics
- Identify network elements such as hubs, switches and routers
- Explain IPv4 and IPv6 addressing, subnetting and CIDR
- Describe transport protocols including TCP and UDP
- Explain commonly used IP protocols such as DHCP, NAT and DNS
- Apply Windows command-line tools for network diagnostics
- Configure Windows Firewall rules and Control Panel network settings
- Plan Active Directory structures including domains, users and group policy

10 Modules, 107 Topics

01

Network Essentials - Course Introduction

TOPICS

Course Introduction

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Lesson One - Network Basics

TOPICS

- Network Basics - Lesson Introduction
- Today's IT Network Structures
- Why use a Network?
- Networking Components and Services
- Networking Terminology Topologies
- Networking Terminology Access / Communication Methods
- OSI Model
- TCP/IP Stack
- OSI Model and TCP/IP Model
- Introducing Protocols
- Addressing and Routing
- Network Basics - Summary
- Network Basics - Quiz

03

Lesson Two - Elements of a Network

TOPICS

- LAN Technologies / Devices / Protocols
- Introducing Hubs, Switches and Routers
- What is a MAC Address?
- Ethernet Frames
- Ethernet Cables
- Network Operating Systems Introduction
- Network Operating System Functions, Multi-User, Authentication and Sharing
- Elements of a Network - Summary

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TCP/IP Basic

TOPICS

- TCP/IP Architecture
- Description of IPv4 Address Structure
- IPv4 Address Classes
- IPv4 Reserved Addresses
- Setting a Static IP Address
- Function of Address Resolution Protocol (ARP)
- The Default Gateway
- The Concept of Subnetworks
- IPv4 Address Decimal Binary Notation
- Overview of CIDR
- Introduction to IPv6
- IPv4 vs IPv6 Address Space
- Types of IPv6 Address
- Introduction to Transport Protocols
- Transmission Control Protocol (TCP)
- User Datagram Protocol (UDP)
- IP Ports

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Commonly Used Network IP Protocols

TOPICS

- Review the TCP/IP Stack in Detail
- Dynamic Host Configuration Protocol (DHCP)
- DHCP Lease Renewal / Refresh
- Switch from Static IP to DHCP Assigned IP Address
- DHCP Relay Agent
- Introduction and Description of NAT
- Introduction and Description of PAT
- Introduction to DNS
- DNS Name Space Syntax
- What is a Domain Name System Server? (Name Server)
- How Internet DNS Names are Resolved
- Internal Name Resolution Process on a Windows Computer
- Introduce Reverse Lookup
- Introduce Client Side DNS Actions Using IPCONFIG
- Introducing TELNET and FTP
- TELNET
- File Transfer Protocol
- Commonly Used IP Network Protocols - Summary

06

Windows Networking Tools

TOPICS

- Windows CLI Network Tools
- Using Netsh
- Basics of IPCONFIG and PING
- Tracert, Finding your Way Through the Network
- IP to MAC, Mapping Physical Address Resolution
- Using Netstat
- Using NSLookup
- Windows Networking Tools - Summary

07

Windows Control Panel

TOPICS

- Windows Control Panel - Introduction
- Network Settings in Control Panel
- What is a Firewall
- The Windows Firewall
- Configure the Windows Firewall with Predefined Rules
- Add Firewall Rule for Network Application using GUI
- Add Firewall Rule for Network Application using Netsh
- Viewing Connected Devices Using Control Panel
- Introduction to Device Manager, Viewing Devices and Drivers
- Introduction to Task Manager
- Printer and Device Status in Control Panel
- Introduction to Event Viewer
- Event Viewer Microsoft Service Logs
- Event Viewer Saving and Clearing Event Logs

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Windows Practical Hands on Exercises

TOPICS

- Windows Local User Accounts
- Local User Profiles
- Sharing and Mapping Folders Introduction
- Creating Shared Folders
- Shared Folder Permissions
- NTFS Permissions
- Combining Share and NTFS Permissions
- Connecting to Shares
- Installing a Network Printer
- Connecting to a Network Printer

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Active Directory

TOPICS

- What is Active Directory?
- Functions of Domain and Forest in AD
- Concepts of Users, Groups and OU's
- Main AD Admin Tools
- Creating User Accounts in AD
- Creating OU's in AD
- AD Group Types and Scopes
- Using Group Policy
- File Servers in AD
- File and Share Management in AD
- AD, Logon, Group Policy and Group Membership in Operation

Troubleshooting

TOPICS

- Troubleshooting - Approaches and Methodology
- Troubleshooting - Network Issues
- Troubleshooting - Client Connectivity
- Troubleshooting - Name Resolution Issues
- Troubleshooting - DHCP Issues
- Troubleshooting - Windows Boot Problems
- Troubleshooting - AD GPO Issues

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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