

# Networking Essentials

## Network Essentials – Course Introduction

- Course Introduction

## Lesson One – Network Basics

- 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

## Lesson Two – Elements of a Network

- 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

### **TCP/IP Basic**

- 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

### **Commonly Used Network IP Protocols**

- 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

### **Windows Networking Tools**

- 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

### **Windows Control Panel**

- 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

### **Windows Practical Hands on Exercises**

- 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

### **Active directory**

- 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**

- 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

