Understanding and Implementing TCP/IP & Network Services for IT Pro

Course Number 7097 – 40 Hours

Overview

This five-day instructor-led course provides students with the knowledge and skills to understand the operation and configuration of the TCP/IP protocol suite and its associated technologies for connectivity, automated addressing, name resolution, and traffic protection. The Course demonstrating and Implementation is based on Microsoft windows Server 2008 R2 and Windows 7 operation System.

On Completion, Delegates will be able to

Describe the protocols in the TCP/IP protocol suite and their function
Work and Analyze network traffic using Wire Shark
Understand the different layers and functionality of the TCP/IP model
Describe the Ethernet Layer and MAC Address requirements
Understand IPv4 Addressing and Subnetting
Understanding Routing and Routing Protocols
Understanding TCP and UDP
Ports and Sockets and Port Scanners
Install and manage the Dynamic Host Configuration Protocol (DHCP)
Understand the Name resolution benefits and protocols
Install and Configure Domain Name System (DNS)
Understand the Windows Internet Name Service(WINS)
Manage and Deploy Microsoft Network Load Balancing
Describe the function and operation of Internet Protocol security (IPsec)
Describe the function and operation of a virtual private network (VPN)
Using Firewalls to secure the network infrastructure
TCP/IP connectivity and how to troubleshoot common TCP/IP problems

Who Should Attend

This course is intended for both IT professionals who wish to have deeper understanding of the TCP/IP functionality and Network Services in the Microsoft Server 2008 R2 environment.

Prerequisites

Before attending this course, students should have the knowledge and experience with configuring Windows Server (Any version)

Course Contents

Module 1: Introduction to TCP/IP
This module explains where TCP/IP came from, how the standards for TCP/IP are defied, TCP/IP network terminology, and how to manually configure TCP/IP for both IPv4 and IPv6.

- History of TCP/IP
- TCP/IP Terminology
- Using Sniffers (WireShark)

Module 2: Architectural Overview of the TCP/IP Protocol Suite
This module explains the architecture of the TCP/IP protocol suite, the protocols at the different layers of the TCP/IP protocol suite (including ARP, IP, ICMP, IGMP), data multiplexing between layers, and TCP/IP programming interfaces and naming schemes.

- The TCP/IP Protocol Suite
- Understanding Ethernet and ARP
- IPv4 Internet Layer
- Internet Control Message Protocol
- Transmission Control Protocol (TCP)
- User Datagram Protocol (UDP)
- Understand Ports and Sockets
- Application Programming Interfaces
- Application Protocols

Module 3: IP Addressing
This module explains how addressing works for IPv4 and IPv6 networks, including the different types of IPv4 and IPv6 addresses and how they are used.

- IPv4 Addressing
- IPv6 Addressing
- Comparing IPv4 and IPv6 Addressing
- IP Subnetting

Module 4: IP Routing
This module explains how IPv4 routing works for a sending host and router in terms of routing table entries and routing infrastructure and how to configure Windows-based hosts and routers.

- IP Routing Overview
- IPv4 Routing
- Routing Tools
- Understanding Switches and Routers
- NAT Benefits
- Understanding NAT
- Configure Dynamic NAT
- Configure Static NAT

Module 5: NAT _Network Address Translation
This module explains how IPv4 NAT works, The reson to use NAT and how to configure it.

- Why to use NAT
- Understanding NAT
- Configure Dynamic NAT
- Configure Static NAT
- Why NAT is gone in the IPv6 environment

Module 6: Dynamic Host Configuration Protocol
This module explains the function and operation of DHCP for automated IPv4 address operation, how to configure a DHCP client, server, and relay agent in Windows.

- DHCP Overview
- How DHCP Works
- The Windows DHCP Server Service
- DHCP Server Service Configuration
- The DHCP Relay Agent

Module 7: Host Name Resolution
This module explains how host name resolution works in Windows, how to configure the Hosts file, and how to manage the DNS client resolver cache.

- TCP/IP Naming Schemes
- Host Name Resolution Process
- The Hosts File
- The DNS Client Resolver Cache

Module 8: Domain Name System Overview
This module explains function and operation of the Domain Name System (DNS) for DNS clients and servers.

- The Hosts File
- The Domain Name System
- Name Resolution
- Name Server Roles
- Resource Records and Zones
- Zone Transfers
- DNS Dynamic Update

Module 9: Windows Support for DNS
This module explains how to configure the DNS Client and DNS Server services in Windows for DNS name resolution.

- The DNS Client Service
- The DNS Server Service
- DNS Server Service Configuration
- DNS and Active Directory AD-DS integration
- Using the DNS troubleshooting Tool

Module 10: NetBIOS over TCP/IP
This module explains how NetBIOS name resolution is defined and how it works in Windows.

- NetBIOS over TCP/IP Overview
- NetBIOS Name Resolution
- NetBIOS Node Types
- Using the Lmhosts File
- The Nbtstat Tool

Module 11: Windows Internet Name Service Overview
This module explains function and operation of the Windows Internet Name Service (WINS) and how to configure a WINS client and server in Windows.

- Introduction to WINS
- How WINS Works
- The WINS Client
- The WINS Server Service
- The WINS Proxy

Module 12: Internet Protocol Security and Packet Filtering
This module explains how to protect network nodes with IPsec and packet filtering and how to configure IPsec and Windows Firewall in Windows.

- IPsec and Packet Filtering Overview
- IPsec
- Packet Filtering

Module 13: Virtual Private Networking
This module explains function and operation of a VPN and how to configure a VPN client and server in Windows.

- Virtual Private Networking Overview
- VPN Protocols
- Remote Access VPN Connections
- Site-to-Site VPN Connections
- Using RADIUS for Network Access Authentication

Module 14: Firewalls and Proxies

- What is a Firewall
- From Packet Filtering into State-full inspection
- Configure Network Firewall (CheckPoint)
- What is a Proxy and why to use it
- The difference between Proxy and Reverse Proxy
- Configure Network Proxy (Microsoft TMG)
- Analyzing Logs

Module 15: The Application Layer

- Application Protocols
- Web Based Protocols
- HTTP & FTP

- Directory Protocol - LDAP
- Messaging Protocols: SMTP, POP, IMAP
- Implementing SSL