Cert Guide

Learn, prepare, and practice for exam success



MCSA 70-741

Networking with Windows Server 2016

PEARSON IT CERTIFICATION

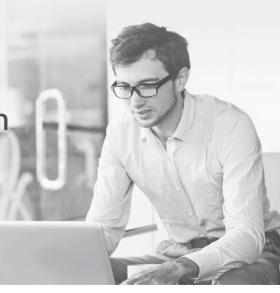
Exclusive Offer – 40% OFF

Pearson IT Certification Video Training

livelessons®

pearsonitcertification.com/video

Use coupon code PITCVIDEO40 during checkout.



Video Instruction from Technology Experts



Advance Your Skills

Get started with fundamentals, become an expert, or get certified.



Train Anywhere

Train anywhere, at your own pace, on any device.



Learn

Learn from trusted author trainers published by Pearson IT Certification.

Try Our Popular Video Training for FREE! pearsonitcertification.com/video

Explore hundreds of **FREE** video lessons from our growing library of Complete Video Courses, LiveLessons, networking talks, and workshops.

PEARSON IT CERTIFICATION

pearsonitcertification.com/video

ALWAYS LEARNING PEARSON

MCSA 70-741 Cert Guide: Networking with Windows Server 2016

Table of Contents

C	റ	V	6	r
\smile	v	v	C	ı

Title Page

Copyright Page

Table of Contents

Introduction

Part I: Implement Windows Server 2016 DNS

Chapter 1 Installing and Configuring DNS Servers

Do I Know This Already? Quiz

Foundation Topics

DNS Fundamentals

DNS Queries

Difference Between Authoritative and Nonauthoritative Responses

Recursive Queries

Iterative Queries

Forwarding

Round Robin

Conditional Forwarding

DNS Server Caching

Cache Locking

Resource Record Types

File-Based Zone Types

Active DirectoryIntegrated Zone Types

Dynamic Update

Delegating DNS Administration

DNS Logging

Aging and Scavenging

DNS Backup



Netmask Ordering

Socket Pool

Nano Server

Windows Server 2016 DNS Installation

Using DNS with Active Directory

Using DNS Without Active Directory

DNS Server Installation Options

Tools for DNS Server Installation

Installing DNS with Server Manager

Installing DNS with PowerShell

Installing a DNS Server on RODC

Installing a DNS Server on Azure

Installing a DNS Server on a Nano Server

Nano Server Zero Footprint Model

Nano Server Deployment Scenarios

Nano Server Recovery Console

DNS Servers Supported on Nano Server

Adding Roles on Nano Server

Adding Nano Server to a Domain

Installing a DNS Server Package on Nano Server

Setting Static IP Addresses on Nano Server

Adding Drivers on Nano Server

Injecting Additional Drivers for Nano Server Deployment

Connecting with WinRM to Nano Server

Deploying Nano DNS Server During Image Creation

Deploying Nano Server and Adding the DNS Package Afterward

Deploying DNS Nano Server to Bare Metal Host

Configuring Nano Server as a DNS Client

Configure and Implement DNS Global Settings Using Windows PowerShell

Set-DnsServerGlobalQueryBlockList

Set-DnsServerResponseRateLimiting

Enabling RRL

Enabling RRL LogOnly-mode

Configuring RRL Exception Lists

Set-DnsServerZoneTransferPolicy

Set-DnsServerRecursionScope



Export-DnsServerZone

Configure Forwarders

Types of Forwarders

Configuring DNS Forwarder with PowerShell

Configuring Forwarder with DNS Manager Console

Selective Recursion Control Using DNS Server Policies

Configuring Root Hints

Configure DNS Delegation

Creating DNS Delegation Automatically

Ignoring DNS Delegation Option

Configuring DNS Delegation with PowerShell

Configure DNS Socket Pool

Configure Cache Locking

Configure DNS Logging

Monitoring Tab

Auditing and Analytic Event Logging

Configure DNS Delegated Administration

DNSAdmins Security Group

Privileged Account Management

Exam Preparation Tasks

Review All the Key Topics

Complete the Tables and Lists from Memory

Definition of Key Terms

End-of-Chapter Review Questions

Chapter 2 Creating and Configuring DNS Zones and Records

Do I Know This Already? Quiz

Foundation Topics

Zone Type Overview

Primary Zones

Secondary Zones

Stub Zones

File-Based Zone Types

Active DirectoryIntegrated Zone Types

Active DirectoryIntegrated Zones



msdcs Zone

Primary Zones

Forward Lookup Zones

Reverse Lookup Zones

Managing Primary Zones with PowerShell

Primary DNS Server as a Single Point of Failure

Fault Tolerance with AD-Integrated DNS Servers

Encrypted DNS Data Replication Traffic

Benefits of AD-Integrated Zones

Managing AD-Integrated Zones with PowerShell

Secondary Zones

Zone Transfer Process

Modifying Zone Transfer Settings Using the DNS Manager

Modifying Zone Transfer Settings Using the Command Line

Types of Zone Transfers

Using DNS Policies in a Primary/Secondary Deployment

Stub Zones

Stub Zone Name Resolution Process

Communication Between DNS Servers That Host Parent and Child Zones

Managing Stub Zones with PowerShell

GlobalNames Zones

Creating a GlobalNames Zone

Managing a GlobalNames Zone with PowerShell

DNSSEC

DNSSEC Zone Signing Wizard

Analyzing Zone-Level Statistics

Windows Server 2012 R2 DNS Server Statistics

Windows Server 2016 Enhanced Zone-Level Statistics

Zone Scavenging

Enabling and Disabling Scavenging

Starting the Scavenging Process

Scavenging Configuration with PowerShell

Record Options

Most Common Resource Records

TLSA Records and Unknown Record Types



Managing Resource Records with PowerShell

DNS Audit and Analytical Events

Enabling or Disabling Analytical DNS Logging

Exam Preparation Tasks

Review All the Key Topics

Complete the Tables and Lists from Memory

Definition of Key Terms

End-of-Chapter Review Questions

Chapter 3 Configuring and Managing DNS Policies

Do I Know This Already? Quiz

Foundation Topics

DHCP Options

DHCP Name Protection

Manage DNS Client Settings with PowerShell

Manage DNS Server Settings with PowerShell

Network Troubleshooting with PowerShell

Understanding Routing

Routing with Windows Server 2016

Split DNS

NRPT and Split DNS

DNS Policies

DNS Policy Elements

Types of DNS Policies and Differences

DNS Policy Parameters

Multiple Query Resolution DNS Policies

Using DNS Policies Based on Location

Using DNS Policies for Split-Brain

Selective Recursion Control with DNS Policies

How Selective Recursion Control with DNS Policies Works

Practice: Block Queries for a Domain with DNS Policies

Practice: Create a Server-Level Zone Transfer Policy

Practice: Create a Zone-Level Zone Transfer Policy

Practice: Block Queries from a Domain



Practice: Allow Queries Only from a Domain

Responses Based on Time of Day

Time-of-Day Responses with Azure App Server

Exam Preparation Tasks

Review All the Key Topics

Complete the Tables and Lists from Memory

Definition of Key Terms

End-of-Chapter Review Questions

Chapter 4 Understanding and Configuring DNSSEC

Do I Know This Already? Quiz

Foundation Topics

DNSSEC Planning

DNSSEC Requirements

Identifying Goals

DNSSEC Staging

Enabling DNSSEC

DNSSEC Functionality

DNSSEC and RODCs

DNSSEC Zone Signing Wizard

Key Master

Transferring the Key Master

Key Signing Key

Understanding ZSK

DNSSEC Monitoring

Event Viewer

DNSSEC Outages

DNSSEC Status Verification

Trust Anchors

DS Resource Record Set

Updating and Removing Trust Anchors

Trust Anchor Types

Trust Anchor Status

Trust Anchor Status Verification

Root Zone Trust Anchor



DNSSEC Priming

Trust Anchor Distribution with Active Directory

Trust Anchor Distribution in Active Directory Using DNS Manager

Trust Anchor Distribution in Active Directory Using PowerShell

ZSK/KSK Rollover Process

DNSSEC Clients

Name Resolution Policy

Security-aware Status

DNSSEC and Delegation

Chain of Trust

DNSSEC Record Types

RRset

DNSKEY Record

DS Record

RRSIG Record

NSEC/NSEC3 Records

Exam Preparation Tasks

Review All the Key Topics

Complete the Tables and Lists from Memory

Define Key Terms

End-of-Chapter Review Questions

Chapter 5 Understanding and Configuring DANE

Do I Know This Already? Quiz

Foundation Topics

DANE Overview

DANE Criteria

DANE Statements

DANE Operation Modes

DANE Bottlenecks

DANE Security

TLSA Records

Configuring DANE

DANE Example Configuration



Common DANE Failures

Exam Preparation Tasks

Review All the Key Topics

Complete the Tables and Lists from Memory

Definition of Key Terms

End-of-Chapter Review Questions

Part II: Implement Windows Server 2016 DHCP

Chapter 6 Installing and Configuring Windows Server 2016 DHCP Server

Do I Know This Already? Quiz

Foundation Topics

DHCP Fundamentals

DHCP Address Allocation Process

DHCP Lease Generation

DHCP Lease Renewal Process

DHCP Database

DHCP Backup

Moving a DHCP Database

DHCP Server Migration

DHCP Data Import

Exporting and Importing DHCP Data with netsh

DHCP Server Installation

Performing DHCP Post-Installation Tasks with PowerShell Commands

DHCP Authorization

Active Directory Requirements

Standalone DHCP Server Considerations

Unauthorized DHCP Servers

DHCP Scopes

Superscopes

Multicast Scopes

Creating and Configuring DHCP Scopes

Creating DHCP Scopes with PowerShell

DHCP Options



Common IPv4 DHCP Scope Options

PXE Boot Options

Common IPv6 DHCP Scope Options

Applying DHCP Options

DHCP Relay Agent

DHCP Security Options

Limited Network Access

DHCP Auditing

DHCP Name Protection

Just Enough Administration

DHCP High Availability

DHCP Clustering

Split Scopes

DHCP Failover

DHCP Failover Overview

Configuring DHCP Failover

DHCP Policies

DHCP Policy Conditions

DHCP Policies Example

Exam Preparation Tasks

Review All the Key Topics

Complete the Tables and Lists from Memory

Definition of Key Terms

End-of-Chapter Review Questions

Part III: Implement Windows Server 2016 IPAM

Chapter 7 Implementing Windows Server 2016 IPAM

Do I Know This Already? Quiz

Foundation Topics

IPAM Fundamentals

IPAM Architecture

IPAM Deployment Requirements

IPAM Deployment Considerations

IPAM Improvements in Windows Server 2012 R2

IPAM Improvements in Windows Server 2016



IPAM Provisioning

IPAM Network Communication

IPAM Administration

Configuring IPAM Options

Configure IPAM Managed Servers

Configuring IPAM Domains

Managing DNS Using IPAM

Create and Manage IP Blocks and Ranges

Managing IP Addressing

Adding Address Spaces to IPAM

Importing and Updating Address Spaces

Finding, Allocating, and Reclaiming IP Addresses

Finding and Allocating IP Addresses in IPAM

Reclaiming IP Addresses in IPAM

IP Address Tracking

Monitor Utilization of IP Address Spaces

Configure IPAM Database Storage Using SQL Server

Purging Utilization Data from IPAM Database

IPAM and SCVMM

Exam Preparation Tasks

Review All the Key Topics

Complete the Tables and Lists from Memory

Definition of Key Terms

End-of-Chapter Review Questions

Chapter 8 Managing DNS and DHCP Using Windows Server 2016 IPAM

Do I Know This Already? Quiz

Foundation Topics

Manage DHCP Server Properties Using IPAM

DHCP Server Properties

DHCP Server Options

Configure DHCP Scopes and Options Using IPAM

Configuring Predefined DHCP Options and Values

Configuring DHCP Scopes Using IPAM

Configure DHCP Policies and Failover Using IPAM



Creating DHCP Policies for Multiple DHCP Servers Using IPAM

Configuring DHCP Failover Using IPAM

Configure DNS Server Properties Using IPAM

Managing DNS Server Properties Using IPAM

Filtering the View of DNS Server Settings

Manage DNS Zones and Records Using IPAM

Managing DNS Zones and Records with PowerShell

Managing DNS Zone Settings Through IPAM

Managing Subdomains Through IPAM

Managing DNS Resource Records Using IPAM

Filtering the View of DNS Resource Records

Saving Views of IPAM DNS Zone Information

Manage DNS and DHCP Servers in Multiple Active Directory Forests Using IPAM

Prerequisites for Managing Multiple Active Directory Forests with IPAM

Configuring Multiple-Forest IPAM Management

Managing DNS Servers and Zones in a Multiple-Forest IPAM Environment

Using RBAC to Delegate DNS and DHCP Server Administration Using IPAM

Exam Preparation Tasks

Review All the Key Topics

Complete the Tables and Lists from Memory

Definition of Key Terms

End-of-Chapter Review Questions

Chapter 9 Windows Server 2016 IPAM Audit Changes and Events

Do I Know This Already? Quiz

Foundation Topics

Audit the Changes Performed on the DNS and DHCP Servers

IPAM Scheduled Tasks

IPAM Monitoring Views

Configuring Logical Groups and Custom Fields with the IPAM Console

Configuring Custom Fields with IPAM in PowerShell

Viewing Changes Performed on IPAM-Managed Servers

IPAM Configuration Events

Best Practices for Using the IPAM Event Catalog



Audit the IPAM Address Usage Trail

Best Practices for Monitoring, Auditing, and Managing

Audit DHCP Lease Events and User Logon Events

Exam Preparation Tasks

Review All the Key Topics

Complete the Tables and Lists from Memory

Definition of Key Terms

End-of-Chapter Review Questions

Part IV: Implement Network Connectivity and Remote Access Solutions

Chapter 10 Windows Server 2016 VPN and DirectAccess Solutions

Do I Know This Already? Quiz

Foundation Topics

Implementing Remote Access and S2S VPN Solutions Using RAS Gateway

Site-to-Site (S2S) VPN

Persistent or On-demand S2S VPN Connections

Configure Different VPN Protocol Options

Configure Authentication Options

Configure VPN Reconnect

Create and Configure VPN Connection Profiles

Configuring VPN Connection Profiles with PowerShell

App-Triggered VPN Feature

Scenarios for RAS VPN and S2S VPN and Appropriate Protocols

Remote Access VPN Connection Scenarios

VPN Connections with PPTP

VPN Connections with L2TP/IPsec

VPN Connections with SSTP

VPN Connections with IKEv2

On-premises S2S VPN Connection Scenarios

On-premises to Microsoft Azure S2S VPN Connection Scenarios

Web Application Proxy Scenarios

Install and Configure DirectAccess

DirectAccess Infrastructure Components



DirectAccess Key Components

DirectAccess Solution Component: DirectAccess Server
DirectAccess Solution Component: DirectAccess Client
DirectAccess Solution Component: Active Directory
DirectAccess Solution Component: DNS Server

Internal Name Resolution
External Name Resolution

NRPT for Local Name Resolution

Split-Brain DNS

LLMNR for Local Name Resolution

DirectAccess Solution Component: Network Location Server

DirectAccess Solution Component: KDC Proxy

DirectAccess Solution Component: Certification Service

DirectAccess Solution Component: Certificates
DirectAccess Solution Component: DNS64
DirectAccess Solution Component: 6to4
DirectAccess Solution Component: ISATAP
DirectAccess Solution Component: Teredo
DirectAccess Solution Component: Group Policy
DirectAccess Solution Component: WMI Filter
DirectAccess Solution Component: NCA

Implement DirectAccess Server Requirements

Basic DirectAccess Deployment

Configuring the Basic DirectAccess Infrastructure (Phase 1)

Configuring Server Network Settings

Configuring Routing

Configuring Firewalls

Configuring DNS Server

Configuring Active Directory

Configuring GPOs

Configuring Security Groups

Configuring Basic DirectAccess Server (Phase 2)

Installing the Remote Access Role

Configuring DirectAccess with the Getting Started Wizard

Updating Clients with the DirectAccess Configuration

Verifying the Basic DirectAccess Deployment (Phase 3)



Advanced DirectAccess Deployment

DirectAccess PowerShell Cmdlets

Implement DirectAccess Client Requirements

Troubleshooting DirectAccess

Exam Preparation Tasks

Review All the Key Topics

Complete the Tables and Lists from Memory

Definition of Key Terms

End-of-Chapter Review Questions

Chapter 11 Windows Server 2016 Network Policy Server

Do I Know This Already? Quiz

Foundation Topics

Implementing RADIUS

Registering the NPS Server in Active Directory

RADIUS Client Configuration

Implementing RADIUS Proxy

Implementing RADIUS Clients

Configuring a VPN Server as a RADIUS Client

Configuring a DirectAccess Server as a RADIUS Client

OTP Certificate Template Planning for Windows Server 2016 DirectAccess Server RADIUS Client

Configure NPS Templates

Configure RADIUS Accounting

NPS Log File Properties

NPS SQL Server Logging

ping user-name

Certificates

Using Certificates for Windows Server 2016 NPS Servers

Configuring Certificate Templates for EAP and PEAP

Connection Request Policies

Default Connection Request Policy

Creating a New Connection Request Policy

Connection Request Policy Tasks



Network Policies for VPN Wireless and Wired Clients

Network Policy Ordering

Network Policy Key Settings

Network Policy Conditions

Configuring NPS for VLANs

Import and Export NPS Policies

Exam Preparation Tasks

Review All the Key Topics

Complete the Tables and Lists from Memory

Definition of Key Terms

End-of-Chapter Review Questions

Part V: Implement Core and Distributed Network Solutions

Chapter 12 Implementing Windows Server 2016 IPv4 and IPv6 Addressing

Do I Know This Already? Quiz

Foundation Topics

Configure IPv4 Addresses and Options

Determine and Configure Appropriate IPv6 Addresses

Configuring Local IPv6 Settings (GUI)

General Tab

Advanced TCP/IP Settings

DNS Tab

IPv4 and IPv6 Assignment Differences

Configuring Local IPv6 Network Settings with PowerShell

About IPv6 Addresses

Configuring IPv6 with DHCPv6

Configure IPv4 and IPv6 Subnetting

Implement IPv6 Stateless Addressing

Configure Interoperability Between IPv4 and IPv6 by Using ISATAP, 6to4, and Teredo Scenarios

IPv6 over IPv4 Tunneling

Differences Among ISATAP, 6to4, and Teredo

Configuring 6to4



Configuring Teredo

Configuring ISATAP

Configure Border Gateway Protocol (BGP)

BGP Features

BGP PowerShell Cmdlets

Configure IPv4 and IPv6 Routing

Exam Preparation Tasks

Review All the Key Topics

Complete the Tables and Lists from Memory

Definition of Key Terms

End-of-Chapter Review Questions

Chapter 13 Implementing Windows Server 2016 DFS and Branch Office Solutions

Do I Know This Already? Quiz

Foundation Topics

Install and Configure DFS Namespaces

Scenarios for Implementing DFS

Branch Office File Sharing

Branch Office Data Collection

Branch Office Data Distribution

Domain-based Namespaces

Standalone Namespaces

Deploying DFS Namespaces

Configuring DFS with PowerShell

Configure DFS Replication and DFSR Scheduling

Configuring Windows Server 2016 DFSR with the GUI

Configuring Windows Server 2016 DFSR with PowerShell

Configure Remote Differential Compression (RDC) Settings

Configure Fault Tolerance

Recover DFS Databases

Optimize DFS Replication

DFS Database Cloning

Data Deduplication and DFSR



Install and Configure BranchCache

BranchCache Protocols

Main Benefits of BranchCache

BranchCache Clients

BranchCache Functionality in Windows Server 2016

BranchCache Modes

BranchCache Requirements

Implement Distributed and Hosted Cache Modes

Configuring BranchCache Client Settings

Configuring BranchCache Server Settings

Implement BranchCache for Web, File, and Application Servers

Troubleshoot BranchCache

Exam Preparation Tasks

Review All the Key Topics

Complete the Tables and Lists from Memory

Definition of Key Terms

End-of-Chapter Review Questions

Part VI: Implement an Advanced Network Infrastructure

Chapter 14 Implementing Windows Server 2016 High-Performance Network Solutions

Do I Know This Already? Quiz

Foundation Topics

Implement NIC Teaming or the Switch Embedded Teaming (SET) Solution, and Identify When to Use Each

What Is Switch Embedded Teaming (SET)?

SET Compatibility

Receive Side Scaling

Quality of Service with Data Center Bridging

SMB Direct on RDMA-Enabled Network Adapters

Considerations for SMB Direct

RDMA

Packet Direct

SMB Multichannel



Receive Side Scaling on a VMQ-Capable Network Adapter

Virtual Machine Multi-Queue

Single-Root I/O Virtualization on a Supported Network Adapter

Software-Defined Networking

Benefits of SDN

SDN Requirements

SDN Configuration

Phase 1: Preparing the Physical Host

Phase 2: Deploying the SDN

Requirements and Scenarios for Implementing Hyper-V Network Virtualization (HNV)

Using Network Virtualization Generic Route Encapsulation (NVGRE) or Virtual Extensible LAN (VXLAN) Encapsulation

HNVv1 and HNVv2

Network Virtualization Generic Routing Encapsulation (NVGRE)

Virtual eXtensible Local Area Network (VXLAN)

Scenarios for Implementing Software Load Balancer (SLB) for NorthSouth and EastWest Load Balancing

SLB Core Functionality

SLB Scale and Performance

SLB High Availability

SLB Alignment

Northbound API

Southbound API

Implementation Scenarios for Various Types of Windows Server Gateways, Including L3, GRE, and S2S, and Their Use

Requirements and Scenarios for Distributed Firewall Policies and Network Security Groups

Benefits of the Datacenter Firewall for CSPs

Benefits of the Datacenter Firewall for Tenants

Configure Datacenter Firewall Access Control Lists (ACL)

Exam Preparation Tasks

Review All the Key Topics

Complete the Tables and Lists from Memory

Definition of Key Terms

End-of-Chapter Review Questions



Chapter 15 Final Preparation

Tools for Final Preparation

Pearson Test Prep Practice Test Software and Questions on the Website

Accessing the Pearson Test Prep Software Online

Accessing the Pearson Test Prep Software Offline

Customizing Your Exams

Updating Your Exams

Premium Edition

Memory Tables

End-of-Chapter Review Tools

Suggested Plan for Final Review/Study

Summary

Part VII: Appendices

Appendix A: Answers to the Do I Know This Already? Quizzes and End-of-Chapter Review Questions

Glossary of Key Terms

Α

В

C

D

E

F

G

Н

K

L

Μ

Ν

P



Q

R

S

Т

U

W

Ζ

Index

Online Chapters

Appendix B: Memory Tables

Appendix C: Memory Tables Answer Key

Appendix D: Study Planner

Where are the companion content files?