

# MCSA: Windows Server 2016

**Microsoft**  
C E R T I F I E D

Solutions Associate

Windows Server 2016

## خلاصه دوره:

دانشجویان عزیز می‌توانند مدرک MCSA 2016 را پس از گذراندن ۳ دوره 20740 (شماره امتحان 70-740)، 20741 (امتحان 70-741) و 20742 (امتحان 70-742) دریافت نمایند.

نام دوره	شماره امتحان	شماره دوره
Installation, Storage, and Compute with Windows Server 2016	70-740	20740
Networking with Windows Server 2016	70-741	20741
Identity with Windows Server 2016	70-742	20742

مدرک فوق برای مدیران شبکه، مسئولین پشتیبانی شبکه، مشاورین و مدیران سیستم‌های شبکه که می‌خواهند در حوزه مدیریت شبکه‌های مبتنی بر سیستم عامل مایکروسافت فعالیت کنند مناسب است. دانشجویان گرامی پس از پایان این دوره علاوه بر نصب، پیکربندی و عیب‌یابی شبکه‌های مبتنی بر مایکروسافت در زمینه‌های زیر نیز اطلاعات بسیار مفیدی کسب خواهند نمود:

- تبدیل شبکه Workgroup به Domain توسط نصب و راه‌اندازی Domain Controller
- مدیریت یک Domain از طریق Group Policy
- مدیریت Update‌های سرورها و کلاینت‌ها توسط WSUS
- مدیریت IP Address های شبکه توسط سرویس DHCP
- نصب و نگهداری سیستم عامل‌های کلاینت‌ها توسط سرویس WDS و از طریق شبکه
- آشنایی با سرویس‌های بنیادی شبکه مانند DNS, NAT, VPN, NPS, NAP و ...
- مدیریت اختصاص فضای دیسک به کاربران توسط FSRM و تهیه گزارش از میزان استفاده هر کاربر

پیشنهاد می‌گردد پس از گذراندن دوره Network+ و همچنین داشتن اطلاعات مختصری در زمینه ساختار کلی شبکه در این دوره شرکت نمایید.

## **Installation, Storage and Compute with Windows Server 2016 Exam Ref 70-740:**

### **Chapter 1 Install Windows Servers in host and compute environments**

**Skill 1.1:** Install, upgrade, and migrate servers and workloads

Determine Windows Server 2016 installation requirements

Determine appropriate Windows Server 2016 editions per workloads

Install Windows Server 2016

Install Windows Server 2016 features and roles

Install and configure Windows Server Core

Manage Windows Server Core installations using Windows PowerShell, command line, and remote management capabilities

Implement Windows PowerShell Desired State Configuration (DSC) to install and maintain integrity of installed environments

Perform upgrades and migrations of servers and core workloads from Windows Server 2008 and Windows Server 2012 to Windows Server 2016

Determine the appropriate activation model for server installation

**Skill 1.2:** Install and configure Nano Server

Determine appropriate usage scenarios and requirements for Nano Server

Install Nano Server

Implement Roles and Features on Nano Server

Manage and configure Nano Server

Managing Nano Server remotely using PowerShell

### **Chapter 2 Implement storage solutions**

**Skill 2.1:** Configure disks and volumes

Configure sector sizes appropriate for various workloads

Configure GUID partition table (GPT) disks

Create VHD and VHDX files using Server Manager or Windows PowerShell

Mount Virtual Hard Disks (VHDs)

Determine when to use NTFS and ReFS File Systems

Configure NFS and SMB shares using Server Manager

- Configure SMB share and session settings using Windows PowerShell
- Configure SMB server and SMB client configuration settings using Windows PowerShell
- Configure file and folder permissions

### **Skill 2.2:** Implement server storage

- Configure storage pools
- Implement simple, mirror, and parity storage layout options for disks or enclosures
- Configure tiered storage
- Configure iSCSI target and initiator
- Configure iSNS
- Configure Datacenter Bridging (DCB)
- Configure Multipath I/O (MPIO)
- Determine usage scenarios for Storage Replica
- Implement Storage Replica for server-to-server, cluster-to-cluster, and stretch cluster scenarios

### **Skill 2.3:** Implement data deduplication

- Implement and configure deduplication
- Determine appropriate usage scenarios for deduplication
- Monitor deduplication
- Implement a backup and restore solution with deduplication
- Chapter summary
- Thought experiment
- Thought experiment answer

## **Chapter 3 Implement Hyper-V**

### **Skill 3.1:** Install and configure Hyper-V

- Determine hardware and compatibility requirements for installing Hyper-V
- Install Hyper-V
- Install management tools
- Upgrade from existing versions of Hyper-V
- Delegate virtual machine management
- Perform remote management of Hyper-V hosts

Configure virtual machines using Windows PowerShell Direct  
Implement nested virtualization

**Skill 3.2:** Configure virtual machine (VM) settings

Creating a virtual machine

Add or remove memory in running a VM

Configure dynamic memory

Configure Non-Uniform Memory Access (NUMA) support

Configure smart paging

Configure resource metering

Manage Integration Services

Create and configure Generation 1 and 2 VMs and determine appropriate usage scenarios

Implement enhanced session mode

Create Linux and FreeBSD VMs

Install and configure Linux Integration Services (LIS)

Install and configure FreeBSD Integration Services (BIS)

Implement Secure Boot for Windows and Linux environments

Move and convert VMs from previous versions of Hyper-V to Windows Server 2016 Hyper-V

Export and import VMs

Implement Discrete Device Assignment (DDA)

**Skill 3.3:** Configure Hyper-V storage

Create VHDX files using Hyper-V Manager

Create shared VHDX files

Configure differencing disks

Modify virtual hard disks

Configure pass-through disks

Resize a virtual hard disk

Manage checkpoints

Implement production checkpoints

Implement a virtual fibre channel adapter

Configure Storage Quality of Service (QoS)

### **Skill 3.4:** Configure Hyper-V networking

Add and remove virtual network interface cards (vNICs)

Configure Hyper-V virtual switches

Optimize network performance

Configure MAC addresses

Configure network isolation

Configure synthetic and legacy virtual network adapters

Configure NIC teaming in VMs

Configure virtual machine queue (VMQ)

Enable Remote Direct Memory Access (RDMA) on network adapters bound to a Hyper-V virtual switch using Switch Embedded Teaming (SET)

Configure bandwidth management

Chapter summary

Thought experiment

Thought experiment answer

## **Chapter 4 Implement Windows containers**

### **Skill 4.1:** Deploy Windows containers

Determine installation requirements and appropriate scenarios for Windows Containers

Install and configure Windows Server Container Host in physical or virtualized environments

Install and configure Windows Server container host to Windows Server Core or Nano Server in a physical or virtualized environment

Install Docker on Windows Server and Nano Server

Configure Docker Daemon start-up options

Configure Windows PowerShell for use with containers

Install a base operating system

Tag an image

Uninstall an operating system image

Create Windows Server containers

Create Hyper-V containers

## Chapter 5 Implement high availability

### **Skill 5.1:** Implement failover clustering

Implement workgroup, single, and multi domain clusters

Configure quorum

Configure cluster networking

Restore single node or cluster configuration

Configure cluster storage

Implement cluster-aware updating

Implement cluster operating system rolling upgrade

Configure and optimize clustered shared volumes (CSVs)

Configure clusters without network names

Implement Scale-Out File Server (SoFS)

Determine different scenarios for the use of SoFS vs. clustered file server

Determine usage scenarios for implementing guest clustering

Implement a clustered Storage Spaces solution using shared SAS storage enclosures

Implement Storage Replica

Implement cloud witness

Implement VM resiliency

Implement shared VHDX as a storage solution for guest clusters

### **Skill 5.2:** Implement Storage Spaces Direct

Determine scenario requirements for implementing Storage Spaces Direct

Enable Storage Spaces direct using Windows PowerShell

Implement a disaggregated Storage Spaces Direct scenario in a cluster

Implement a hyper-converged Storage Spaces Direct scenario in a cluster

### **Skill 5.3:** Implement Network Load Balancing (NLB)

Configure NLB prerequisites

Install NLB nodes

Configure affinity

Configure port rules

Configure cluster operation mode

Upgrade an NLB cluster

Chapter summary  
Thought experiment  
Thought experiment answer

## **Chapter 6 Maintain and monitor server environments**

### **Skill 6.1:** Maintain server installations

Implement Windows Server Update Services (WSUS) solutions

Configure WSUS groups

Manage patch management in mixed environments

Implement an antimalware solution with Windows Defender

Integrate Windows Defender with WSUS and Windows Update

Perform backup and restore operations using Windows Server Backup

Determine backup strategies for different Windows Server roles and workloads, including Hyper-V Host, Hyper-V Guests, Active Directory, File Servers, and Web Servers using Windows Server 2016 native tools and solutions

### **Skill 6.2:** Monitor server installations

Monitor workloads using Performance Monitor

Configure data collector sets

Determine appropriate CPU, memory, disk, and networking counters for storage and compute workloads

Configure alerts

Monitor workloads using Resource Monitor

Chapter summary

Thought experiment

Thought experiment answer

## **Networking with Windows Server 2016**

### **Exam Ref 70-741:**

## **Chapter 1 Implement Domain Name System**

### **Skill 1.1:** Install and configure DNS servers

Overview of name resolution

Determine DNS installation requirements

- Install the DNS server role
- Determine supported DNS deployment scenarios on Nano Server
- Configure forwarders, root hints, recursion, and delegation
- Configure advanced DNS settings
- Administering DNS

**Skill 1.2:** Create and configure DNS zones and records

- Overview of DNS zones
- Configure DNS zones
- Configure DNS records
- Configure DNS scopes
- Monitor DNS
- Summary
- Thought experiment
- Thought experiment answers

## Chapter 2 Implement DHCP

**Skill 2.1:** Install and configure DHCP

- Overview of DHCP
- Install DHCP
- Create and manage DHCP scopes
- Configure DHCP relay agent and PXE boot
- Export, import and migrate a DHCP server
- Skill 2.2: Manage and maintain DHCP
- Configure high availability using DHCP failover
- Backup and restore the DHCP database
- Troubleshoot DHCP
- Summary
- Thought experiment
- Thought experiment answer



## Chapter 3 Implement IP address management (IPAM)

### **Skill 3.1:** Install and configure IP address management

Architecture

Requirements and planning considerations

Configure IPAM database storage using SQL Server

Provision IPAM manually or by using Group Policy

Configure server discovery

Create and manage IP blocks and ranges

Monitor utilization of IP address space

Migrate existing workloads to IPAM

Determine scenarios for using IPAM with System Center VMM for physical and virtual IP address space management

### **Skill 3.2:** Manage DNS and DHCP using IPAM

Manage DHCP with IPAM

Manage DNS with IPAM

Manage DNS and DHCP servers in multiple Active Directory forests

Delegate administration for DNS and DHCP using RBAC

### **Skill 3.3:** Audit IPAM

Audit the changes performed on the DNS and DHCP servers

Audit the IPAM address usage trail

Audit DHCP lease events and user logon events

Chapter summary

Thought experiment

Thought experiment answers

## Chapter 4 Implement network connectivity and remote access solutions

### **Skill 4.1:** Implement network connectivity solutions

Implement NAT

Configure routing

### **Skill 4.2:** Implement VPN and DirectAccess solutions

Overview of VPNs

Determine when to use remote access VPN and S2S VPN and to configure appropriate protocols

Implement DirectAccess

Troubleshoot DirectAccess

### **Skill 4.3:** Implement NPS

Configure RADIUS

Configure NPS templates

Configure NPS policies

Configure certificates

Summary

Thought experiment

Thought experiment answers

## **Chapter 5 Implement core and distributed network solutions**

### **Skill 5.1:** Implement IPv4 and IPv6 addressing

Implement IPv4 addressing

Implement IPv6 addressing

Configure interoperability between IPv4 and IPv6

Configure IPv4 and IPv6 routing

Configure BGP

### **Skill 5.2:** Implement DFS and branch office solutions

Install and configure DFS namespaces

Configure DFS replication

Configure DFS fault tolerance

Manage DFS databases

Implement BranchCache

Chapter summary

Thought experiment

Thought experiment answers

## **\*\* Microsoft IIS 10.0**

Installing IIS 10.0 on Windows Server 2016

Basic configuration of IIS 10.0

Understanding and Creating an Application Pool in IIS 10.0

Hosting Multiple Websites on IIS 10.0

Configuring ports

Configuring the website IP

Understanding and Creating Virtual Directories in IIS 10.0

IP address and domain restrictions

URL authorization and authentication

Installing and Configuring SSL Websites

Understanding and Installing FTP

## **\*\*Encrypting File System (EFS)**

Enable or Disable NTFS File Encryption in Windows

Decrypt Files and Folders Encrypted with EFS in Windows

Back Up Your EFS File Encryption Certificate and Key in Windows

Import Your EFS File Encryption Certificate and Key in Windows

Manually create an EFS DRA certificate

Encrypt Folder in Command Prompt

## **Identify with Windows Server 2016**

### **Exam Ref 70-742:**

## **Chapter 1 Install and configure Active Directory Domain Services**

**Skill 1.1:** Install and configure domain controllers

AD DS fundamentals

Install a new forest

Add or remove a domain controller

Install AD DS on a Server Core installation

Install a domain controller using Install from Media

Install and configure a read-only domain controller

- Configure a global catalog server
- Configure domain controller cloning
- Upgrade domain controllers
- Transfer and seize operations master roles
- Resolve DNS SRV record registration issues

**Skill 1.2:** Create and manage Active Directory users and computers

- Create, copy, configure, and delete users and computers
- Implement offline domain join
- Configure user rights
- Perform bulk Active Directory operations

**Skill 1.3:** Create and manage Active Directory groups and organizational units

- Create and manage groups
- Create and manage OUs
- Delegate management of Active Directory with groups and OUs
- Chapter summary
- Thought experiment
- Thought experiment answer

## **Chapter 2 Manage and maintain AD DS**

**Skill 2.1:** Configure service authentication and account policies

- Create and configure MSAs and gMSAs
- Manage SPNs
- Configure Kerberos Constrained Delegation
- Configure virtual accounts
- Configure account policies
- Configure and apply Password Settings Objects
- Delegate password settings management

**Skill 2.2:** Maintain Active Directory

- Manage Active Directory offline

Active Directory backup and recovery  
Manage Read Only Domain Controllers  
Managing AD DS replication

**Skill 2.3:** Configure Active Directory in a complex enterprise environment

Configure a multi-domain and multi-forest AD DS infrastructure  
Deploy Windows Server 2016 domain controllers within a preexisting AD DS environment

Upgrade existing domains and forests  
Configure domain and forest functional levels  
Configure multiple user principal name suffixes  
Configure trusts  
Configure AD DS sites and subnets  
Chapter summary  
Thought experiment  
Thought experiment answers

## **Chapter 3 Create and manage Group Policy**

**Skill 3.1:** Create and manage Group Policy Objects

Configure multiple local Group Policies  
Overview of domain-based GPOs  
Manage starter GPOs  
Configure GPO links  
Back up, restore, import, and copy GPOs  
Create and configure a migration table  
Reset default GPOs  
Delegate Group Policy management  
Detect health issues using the Group Policy  
Infrastructure Status dashboard

**Skill 3.2:** Configure Group Policy processing

Configure processing order and precedence  
Configuring inheritance  
Configure security filtering and WMI filtering

- Configure loopback processing
- Configure and manage slow-link processing and Group Policy caching
- Configure client-side extension behavior
- Force a Group Policy update

**Skill 3.3:** Configure Group Policy settings

- Configure software installation
- Configure scripts
- Import security templates
- Configure folder redirection
- Configure administrative templates

**Skill 3.4:** Configure Group Policy preferences

- Configuring Group Policy preferences
- Configure item-level targeting
- Chapter summary
- Thought experiment
- Thought experiment answers

## **Chapter 4 Implement Active Directory Certificate Services**

**Skill 4.1:** Install and configure AD CS

- Choosing between a standalone and an enterprise CA
- Install standalone CAs
- Install an AD DS integrated enterprise CA
- Install offline root and subordinate CAs
- Install and configure an Online Responder
- Implement administrative role separation
- Configure CA backup and recovery

**Skill 4.2:** Manage certificates

- Manage certificate templates
- Implement and manage certificate deployment, validation, and revocation
- Configure and manage key archival and recovery

Chapter summary  
Thought experiment  
Thought experiment answers

## **Chapter 5 Implement identity federation and access solutions**

### **Skill 5.1: Install and configure AD RMS**

An AD RMS overview  
Deploying an AD RMS server  
Manage rights policy templates  
Configure exclusion policies  
Backup and restore AD RMS  
Chapter summary  
Thought experiment  
Thought experiment answers

### **\*\*Install Additional Domain Controller**

Add Active Directory Domain Services Role  
Add a domain controller to an existing domain  
Configure TCP/IP Properties  
Domain Controller Load Balancing  
DNS settings of server are pointing towards correct AD domain controller  
DNS Round Robin

### **\*\*Install Active Directory Forest in Windows Server 2016**

How to Add Child Domain in an Existing Forest  
How to Add Tree Domain in an Existing Forest