MCSA: Windows Server 2016 – Skills Measured

NOTE: The bullets that appear below each of the skills measured are intended to illustrate how we are assessing that skill. This list is not definitive or exhaustive.

NOTE: In most cases, exams do NOT cover preview features, and some features will only be added to an exam when they are GA (General Availability).

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

Install Windows Servers in Host and Compute Environments (10-15%)

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, such as Automatic Virtual Machine Activation (AVMA), Key Management Service (KMS), and Active Directory-based Activation

Create, manage, and maintain images for deployment

- plan for Windows Server virtualization; assess virtualization workloads using the Microsoft Assessment and Planning (MAP) Toolkit; determine considerations for deploying workloads into virtualized environments; update images with patches, hotfixes, last cumulative updates and drivers; install roles and features in offline images; manage and maintain Windows Server Core, and VHDs using Windows PowerShell

Implement Storage Solutions (15-20%)

Configure disks and volumes

- configure sector sizes appropriate for various workloads; configure GUID partition table (GPT) disks; create VHD and VHDX files using Disk Management or Windows PowerShell;

mount virtual hard disks; 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

Implement server storage

- configure storage pools; implement simple, mirror, and parity storage layout options for disks or enclosures; expand storage pools; configure Tiered Storage; configure iSCSI target and initiator; configure iSNS; configure Datacenter Bridging (DCB); configure Multi-Path IO (MPIO); determine usage scenarios for Storage Replica; implement Storage Replica for server-to-server, cluster-to-cluster, and stretch cluster scenarios

Implement data deduplication

- implement and configure deduplication; determine appropriate usage scenarios for deduplication; monitor deduplication; implement a backup and restore solution with deduplication

Implement Hyper-V (20-25%)

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; Using Windows PowerShell Direct; implement nested virtualization

Configure virtual machine (VM) settings

- add or remove memory in a running 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), Troubleshoot VM configuration versions

Configure Hyper-V storage

- create VHDs and 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)

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

Implement Windows Containers (5-10%)

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 in a physical or virtualized environment; install Docker Enterprise Edition on Windows Server; configure Docker start-up options; install a base container image; tag an image; remove a container; create Windows Server containers; create Hyper-V containers

Manage Windows containers

- manage Windows containers by using Docker CLI; manage container networking; manage container data volumes; manage Resource Control; create new container images using Dockerfile; manage container images using DockerHub repository for public and private scenarios; manage container images using Microsoft Azure

Implement High Availability (30-35%)

Implement high availability and disaster recovery options in Hyper-V

- implement Hyper-V Replica; implement Live Migration including Shared Nothing Live Migration; configure CredSSP or Kerberos authentication protocol for Live Migration; implement storage migration

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 cluster shared volumes (CSVs); configure clusters without network names; implement Scale-Out File Server (SoFS); determine different scenarios for the use of SoFS vs. File Server for general use; 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

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; implement a hyper-converged Storage Spaces Direct scenario

Manage failover clustering

- configure role-specific settings, including continuously available shares; configure VM monitoring; configure failover and preference settings; implement stretch and site-aware failover clusters; enable and configure node fairness

Manage VM movement in clustered nodes

- perform a live migration; perform a quick migration; perform a storage migration; import, export, and copy VMs; configure VM network health protection; configure drain on shutdown

Implement Network Load Balancing (NLB)

- install NLB nodes; configure NLB prerequisites; configure affinity; configure port rules; configure cluster operation mode; upgrade an NLB cluster

Maintain and Monitor Server Environments (10-15%)

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

Monitor server installations

- monitor workloads using Performance Monitor, Server Manager, Event Viewer; configure Data Collector Sets; determine appropriate CPU, memory, disk, and networking counters for storage and compute workloads; configure alerts; monitor workloads using Resource Monitor, manage and monitor Windows Server by using Windows Admin Center

Exam 70-741: Networking with Windows Server 2016

Implement Domain Name System (DNS) (15-20%)

Install and configure DNS servers

- determine DNS installation requirements; install DNS; configure forwarders; configure Root Hints; configure delegation; implement DNS policies; Configure DNS Server settings using Windows PowerShell; configure Domain Name System Security Extensions (DNSSEC); configure DNS Socket Pool; configure cache locking; enable Response Rate Limiting; configure DNS-based Authentication of Named Entities (DANE); configure DNS logging; configure delegated administration; configure recursion settings; implement DNS performance tuning; configure global settings

Create and configure DNS zones and records

- create primary zones; configure Active Directory primary zones; create and configure secondary zones; create and configure stub zones; configure a GlobalNames zone; analyze zone-level statistics; create and configure DNS Resource Records (RR), including A, AAAA, PTR, SOA, NS, SRV, CNAME, and MX records; configure zone scavenging; configure record options, including Time To Live (TTL) and weight; configure round robin; configure secure dynamic updates; configure unknown record support; use DNS audit events and analytical (query) events for auditing and troubleshooting; configure Zone Scopes; configure records in Zone Scopes; configure policies for zones

Implement DHCP and IPAM (25-30%)

Install and configure DHCP

- install and configure DHCP servers; authorize a DHCP server; create and configure scopes; create and configure superscopes and multicast scopes; configure a DHCP reservation; configure DHCP options; configure DNS options from within DHCP; configure policies; configure client and server for PXE boot; configure DHCP Relay Agent; implement IPv6 addressing using DHCPv6; perform export and import of a DHCP server; perform DHCP server migration

Manage and maintain DHCP

- Configure a lease period; back up and restore the DHCP database; configure high availability using DHCP failover; configure DHCP name protection; troubleshoot DHCP

Implement and Maintain IP Address Management (IPAM)

- 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; configure IPAM database storage using SQL Server; determine scenarios for using IPAM with System Center Virtual Machine Manager for physical and virtual IP address space management, Manage DHCP server properties using IPAM; configure DHCP scopes and options; configure DHCP policies and failover; manage DNS server properties using IPAM; manage DNS zones and records; manage DNS and DHCP servers in multiple Active Directory forests; delegate administration for DNS and DHCP using role-based access control (RBAC); Audit the changes performed on the DNS and DHCP servers; audit the IPAM address usage trail; audit DHCP lease events and user logon events

Implement Network Connectivity and Remote Access Solutions (20-25%)

Implement network connectivity solutions

- implement Network Address Translation (NAT); configure routing

Implement virtual private network (VPN) and DirectAccess solutions

- implement remote access and site-to-site (S2S) VPN solutions using remote access gateway; configure different VPN protocol options; configure authentication options; configure VPN reconnect; create and configure connection profiles; determine when to use remote access VPN and site-to-site VPN and configure appropriate protocols; install and configure DirectAccess; implement server requirements; implement client configuration; troubleshoot DirectAccess

Implement Network Policy Server (NPS)

- configure a RADIUS server including RADIUS proxy; configure RADIUS clients; configure NPS templates; configure RADIUS accounting; configure certificates; configure Connection Request Policies; configure network policies for VPN and wireless and wired clients; import and export NPS policies

Implement Core and Distributed Network Solutions (15-20%)

Implement IPv4 and IPv6 addressing

- configure IPv4 addresses and options; determine and configure appropriate IPv6 addresses; configure IPv4 or IPv6 subnetting; implement IPv6 stateless addressing; configure interoperability between IPv4 and IPv6 by using ISATAP, 6to4, and Teredo scenarios; configure Border Gateway Protocol (BGP); configure IPv4 and IPv6 routing

Implement Distributed File System (DFS) and Branch Office solutions

- install and configure DFS namespaces; configure DFS replication targets; configure replication scheduling; configure Remote Differential Compression (RDC) settings; configure staging; configure fault tolerance; clone a Distributed File System Replication (DFSR) database; recover DFSR databases; optimize DFS Replication; install and configure BranchCache; implement distributed and hosted cache modes; implement BranchCache for web, file, and application servers;; troubleshoot BranchCache

Implement an Advanced Network Infrastructure (15-20%)

Implement high performance network solutions

- implement NIC Teaming or the Switch Embedded Teaming (SET) solution and identify when to use each; enable and configure Receive Side Scaling (RSS); enable and configure network Quality of Service (QoS) with Data Center Bridging (DCB); enable and configure SMB Direct on Remote Direct Memory Access (RDMA) enabled network adapters; configure SMB Multichannel; enable and configure virtual Receive Side Scaling (vRSS) on a Virtual Machine Queue (VMQ) capable network adapter; enable and configure Virtual Machine Multi-Queue (VMMQ); enable and configure Single-Root I/O Virtualization (SR-IOV) on a supported network adapter

Determine scenarios and requirements for implementing Software Defined Networking (SDN)

- determine deployment scenarios and network requirements for deploying SDN; determine requirements and scenarios for implementing Hyper-V Network Virtualization (HNV) using Network Virtualization Generic Route Encapsulation (NVGRE) encapsulation or Virtual Extensible LAN (VXLAN) encapsulation; determine scenarios for implementation of Software Load Balancer (SLB) for North-South and East-West load balancing; determine implementation scenarios for various types of Windows Server Gateways, including L3, GRE, and S2S, and their use; determine requirements and scenarios for Datacenter firewall policies and network security groups

Exam 70-742: Identity with Windows Server 2016

Install and Configure Active Directory Domain Services (AD DS) (20-25%)

Install and configure domain controllers

- install a new forest; add or remove a domain controller from a domain; upgrade a domain controller; install AD DS on a Server Core installation; install a domain controller from Install from Media (IFM); resolve DNS SRV record registration issues; configure a global catalog server; transfer and seize operations master roles; install and configure a read-only domain controller (RODC); configure domain controller cloning

Create and manage Active Directory users and computers

- automate the creation of Active Directory accounts; create, copy, configure, and delete users and computers; configure templates; perform bulk Active Directory operations; configure user rights; implement offline domain join; manage inactive and disabled accounts; automate unlocking of disabled accounts; automate password resets

Create and manage Active Directory groups and organizational units (OUs)

- configure group nesting; convert groups, including security, distribution, universal, domain local, and global; manage group membership using Group Policy; enumerate group membership; automate group membership management using Windows PowerShell; delegate the creation and management of Active Directory groups and OUs; manage default Active Directory containers; create, copy, configure, and delete groups and OUs.

Manage and Maintain AD DS (15-20%)

Configure service authentication and account policies

- create and configure Service Accounts; create and configure Group Managed Service Accounts (gMSAs); configure Kerberos Constrained Delegation (KCD); manage Service Principal Names (SPNs); configure virtual accounts; configure domain and local user password policy settings; configure and apply Password Settings Objects (PSOs); delegate password settings management; configure account lockout policy settings; configure Kerberos policy settings within Group Policy, configure Authentication Policies and Authentication Policy Silos

Maintain Active Directory

- back up Active Directory and SYSVOL; manage Active Directory offline; perform offline defragmentation of an Active Directory database; clean up metadata; configure Active Directory snapshots; perform object- and container-level recovery; perform Active Directory restore; configure and restore objects by using the Active Directory Recycle Bin; configure replication to Read-Only Domain Controllers (RODCs); configure Password Replication Policy (PRP) for RODC; monitor and manage replication; upgrade SYSVOL replication to Distributed File System Replication (DFSR)

Configure Active Directory in a complex enterprise environment

- configure a multi-domain and multi-forest Active Directory infrastructure; deploy Windows Server 2016 domain controllers within a preexisting Active Directory environment; upgrade existing domains and forests; configure domain and forest functional levels; configure multiple user principal name (UPN) suffixes; configure external, forest, shortcut, and realm trusts; configure trust authentication; configure SID filtering; configure name suffix routing; configure sites and subnets; create and configure site links; manage site coverage; manage registration of SRV records; move domain controllers between sites

Create and Manage Group Policy (25-30%)

Create and manage Group Policy Objects (GPOs)

- configure a central store; manage starter GPOs; configure GPO links; configure multiple local Group Policies; back up, import, copy, and restore GPOs; create and configure a migration table; reset default GPOs; delegate Group Policy management; detect health issues using the Group Policy Infrastructure Status page

Configure Group Policy processing

- configure processing order and precedence; configure blocking of inheritance; configure enforced policies; configure security filtering and Windows Management Instrumentation (WMI) filtering; configure loopback processing; configure and manage slow-link processing and Group Policy caching; configure client-side extension (CSE) behavior; force a Group Policy update

Configure Group Policy settings

- configure software installation; configure folder redirection; configure scripts; configure administrative templates; import security templates; import a custom administrative template file; configure filtering for administrative template

Configure Group Policy preferences

- configure printer preferences; define network drive mappings; configure power options; configure custom registry settings; configure Control Panel settings; configure Internet Explorer settings; configure file and folder deployment; configure shortcut deployment; configure item-level targeting

Implement Active Directory Certificate Services (AD CS) (10-15%)

Install and configure AD CS

- install Active Directory Integrated Enterprise Certificate Authority (CA); install offline root and subordinate CAs; install standalone CAs; configure Certificate Revocation List (CRL) distribution points; install and configure Online Responder; implement administrative role separation; configure CA backup and recovery

Manage certificates

- manage certificate templates; implement and manage certificate deployment, validation, and revocation; manage certificate renewal; manage certificate enrolment and renewal for computers and users using Group Policies; configure and manage key archival and recovery

Implement Identity Federation and Access Solutions (15-20%)

Install and configure Active Directory Federation Services (AD FS)

- upgrade and migrate previous AD FS workloads to Windows Server 2016; implement claims-based authentication, including Relying Party Trusts; configure authentication policies; configure multi-factor authentication; implement and configure device registration; integrate AD FS with Microsoft Passport; configure for use with Microsoft Azure and Office 365; configure AD FS to enable authentication of users stored in LDAP directories

Implement Web Application Proxy (WAP)

- install and configure WAP; implement WAP in pass-through mode; implement WAP as AD FS proxy; integrate WAP with AD FS; configure AD FS requirements; publish web apps via WAP; publish Remote Desktop Gateway applications; configure HTTP to HTTPS redirects; configure internal and external Fully Qualified Domain Names (FQDNs)

Install and configure Active Directory Rights Management Services (AD RMS)

- install a licensor certificate AD RMS server; manage AD RMS Service Connection Point (SCP); manage AD RMS templates; configure Exclusion Policies; back up and restore AD RMS